EKISTICS

ABSTRACTS ON THE PROBLEMS AND SCIENCE OF HUMAN SETTLEMENTS

ΟΙΚΙΣΤΙΚΗ

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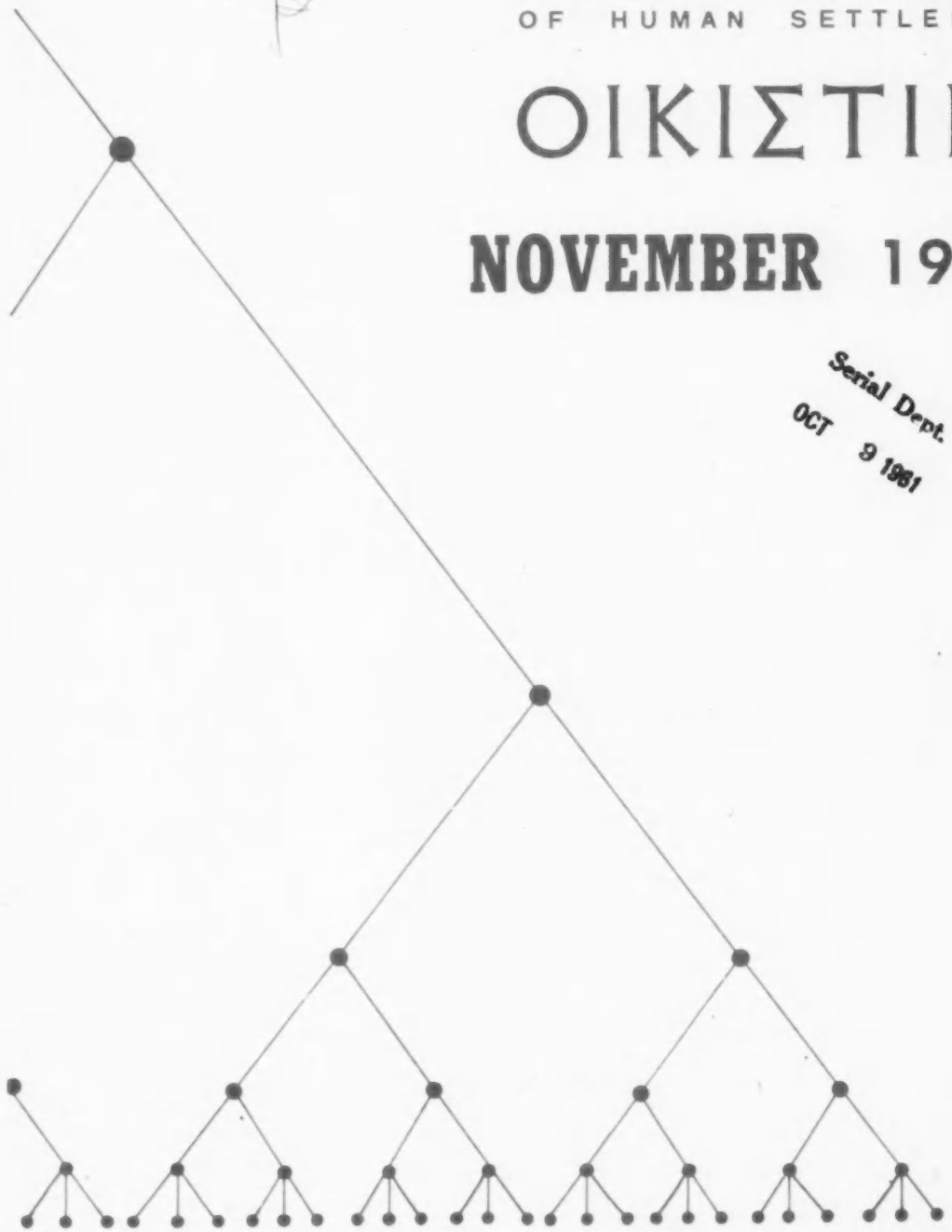

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Cover Illustration: As a basic principle we must seek the proper hierarchy of units and settlements in order to plot the settlements of the future in a rational way from their basic element, which is the house up to the largest settlement.: from, "The Science of Ekistics" by Dr. C. A. Doxiadis.

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E K I S T I C S

ABSTRACTS

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EKISTICS is compiled by Mrs. Gwen Bell under the direction of Prof. J. Tyrwhitt.

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EDITORIAL

This month's EKISTICS is devoted to reports of research work, seminars, and meetings which concern themselves with basic factors in the development of settlements. These articles bring out the general world-wide implications and factors for their particular subject matter.

RESEARCH IN HOUSING AND TECHNOLOGY

Dr. C. A. Doxiadis provides a provocative lead article on the relation of housing to the broader scope of ekistics. This is the result of many years of international study and observation of the role of housing within society, in urban and rural areas, in highly advanced and underdeveloped regions, and in a great variety of geographic locations. The very pointed illustrations sum up this study very well and suggest a perspective in which to analyze a particular housing situation anywhere in the world.

The Housing Committee of the United Nations Economic Commission for Europe has recently completed the provisional version of its findings in a lengthy study of the utilization of space in dwellings. While this study has only been done for Europe, the technique of surveying and analysis provides a well thought-out model for conducting a similar study elsewhere whether within a single country or a wider group. In addition, it presents a set of definitions and symbols which are unified to allow comparison. The need for surveys and analyses of housing, its quantity, quality, and usage, is a very significant aspect of census material in developing countries: an understanding of population trends and problems and its translation into plan is often stymied by the lack of similarly understanding the housing conditions. Thus, such surveys as this are a vital part of knowledge basic to planning for development, and should be encouraged.

Developing technology has often introduced foreign and out-of-place innovations to the traditional cultures of under-developed countries. Well meaning though these innovations often are, the thought that it is important and necessary to utilize traditional cultural methods and materials is receiving greater recognition. The study of perforated burnt-clay brick by the Tropical Building Section of the British Commonwealth Department of Industrial and Scientific Research bridges a gap between tradition and new technology. They have used modern research and analysis in the study of the various kinds of burnt-clay brick which can be used in those areas where brick is a traditional building material. Their outline and evaluation of the various qualities of different kind of perforations is useful as reference for deciding upon a particular type for a particular building, thus adding the benefits of scientific research and new designs to a traditional material.

However, in some cases, it is valuable to turn to an entirely new innovation to achieve the greatest benefit for a society: such is the case of the solar cooker. A progress report of the development of a solar stove and its trial applications by the research group at the University of Wisconsin is an excellent example of how anthropologists and sociologists can work with the technologists to coordinate the introduction of an innovation into a society.

SEMINARS AND MEETINGS ON DEVELOPMENT AND PLANNING

EKISTICS is pleased to have the opportunity to publish abstracts from the rough drafts of papers from a group of seminars held on various aspects of economic development at Pembroke College, Cambridge, England. The chairmen of these meetings were distinguished government officials concerned with the practical implications of development. They brought special attention to the everyday practicality of economic development in terms of external assistance, government organization, development corporations, and social problems.

There are still many problems of the relation of social and physical planning even in countries where these processes are already supposedly at a sophisticated level. These were brought out and discussed by a distinguished group of English planners and architects at a symposium held at the London School of Economics.

The United Nations has promoted seminars as well as research on various aspects of ekistics. This month the conclusions from a Land Settlement Tour through part of Southeast Asia is presented, and next month a report on a seminar on urbanization problems in Latin America will be abstracted. The facilities of the United Nations have given the impetus for many development programs through its research and seminars. Yet, excellent though this is, it can only be viewed as a spark-plug starting nations on their own programs of research and development.

The Athens Technological Institute
TRAINING IN EKISTICS

1. In the August issue of EKISTICS (HIB-GA 46) we published a brief description of the two year program in Ekistics offered by the Athens Technological Institute and a special intensive course being instituted for a group of Pakistanis.

2. The basis of both courses is a continuing series of lectures and exercises in three subjects:

Community facilities and public works;
Ekistic aspects of architecture;
Theory and practice of Ekistics.

Other subjects include economics, statistics, theory and history of civilization, geography, sociology and housing management, and law.

3. A brief description of the coverage of each course was given, with the exception of the key course--the theory and practice of Ekistics. This oversight we hasten to make right by reproducing the description issued in a report published by the school:

4. Theory and Practice of Ekistics. Ekistics is the comprehensive course which links all the previous ones together for the shaping of Ekistic policy, Ekistic programs, groups of settlements and single settlements. The course on Ekistics fall into six parts: (1) general, (2) the Ekistics of regions, (3) the Ekistics of urban centres, (5) Ekistic factors and (6) Ekistic methods.

(1) General Ekistics covering Ekistic analysis, Ekistic theory, and Ekistic synthesis which comprises Policies and Programs.

(2) The Ekistics of regions which is the application of Ekistic analysis, theory and synthesis, in the form in which they occur in regions where groups of urban and rural settlements are found.

(3) The Ekistics of urban centres and (4) the Ekistics of rural centres which are the application of General Ekistics to urban and rural settlements.

(5) Ekistic factors which are: man, shelter and the structures and technical works of human settlements. For each of these factors and analysis is made of existing problems, policy and programs.

(6) Ekistic methods and data concerning analysis, research, planning, materials, constructions, manpower, legislation, administration, etc. Every aspect is presented in a way best suited to serve Ekistics.

EKISTICS, THE KEY TO HOUSING IN DEVELOPING AREAS

C. A. Doxiadis

Abstract from a report prepared for the CIB Congress in Rotterdam, September, 1959.

A. INTRODUCTION

1. When experts speak of housing in developing areas and try to find solutions to this basic problem, they usually think and talk about building materials, methods of construction and costs of house construction. They seldom concentrate on the problem of policies with regard to physical planning and housing or the even broader problem of programming, preparation of programs, etc.

B. HOUSING PROBLEMS IN DEVELOPING AREAS

2. In the past, up to a generation or two ago, housing presented no greater problem for most countries than the problem of food or clothing and health. In many cases it was an even minor problem as people could always build some kind of house whilst they could not always find the appropriate kind of food. If there was a major problem in underdeveloped areas, it was the lack of appropriate food and certainly not the lack of houses.

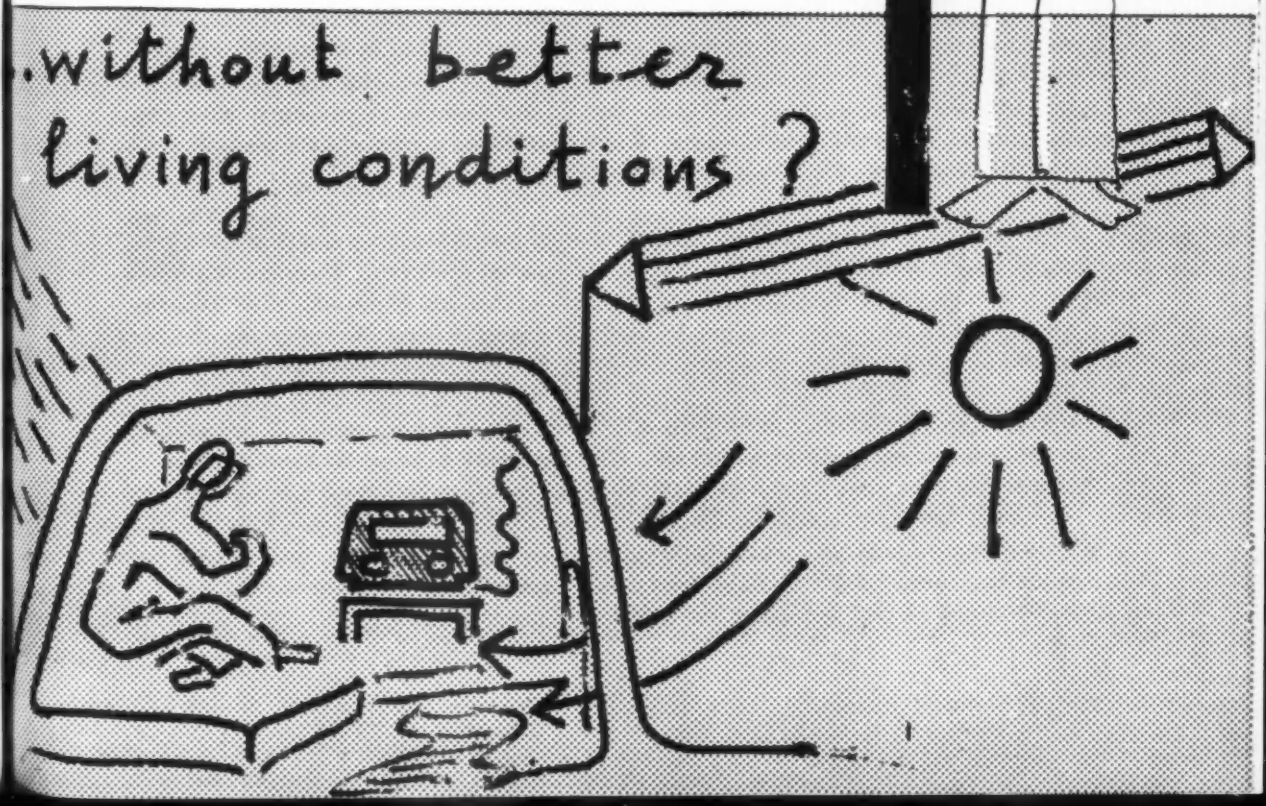
3. The main cause of the housing problems created to-day is the great change in demand for houses and housing facilities in general. This is due to two big reasons: the increase and movements of population and the splitting of the old patriarchal families with rises of income. The new health conditions which have permitted a greater increase of the population than ever before, have not been equalled by an increase of the production of houses by the people. These remain at perhaps the same number and of the same quality as before, whilst the housing needs have become much greater. Further the splitting up of families has created the need for more housing units even for the same number of people.

4. In addition, the changes in geographical distribution are such that new colossal needs for houses have been created in all urban and industrial centers. People tend to abandon certain areas and to concentrate in new centers of central functions, new market centers, new centers of administration.

5. To these two basic reasons for additional needs of numbers of housing units we have another one, which is of the greatest importance. This is the change in requirements, the demand for higher standards. The fact that the new factory worker up to

Why higher incomes and development...

...without better living conditions?



now was working in the fields, in the mud, toiling with the soil all day, and was satisfied to go back to a hut with a thatched roof and a mud floor, does not mean that in his new life, working in a concrete or stone building with a good roof, with a well paved clean floor and perhaps air-conditioning, he will be satisfied to go back to live in the same house.

6. We cannot expect an industrial worker, who tends a machine and who has to protect, maintain and oil it, to return at night to live on a damp mud floor. This man now has much higher requirements, which, if not satisfied, will not enable him to become a good industrial worker.

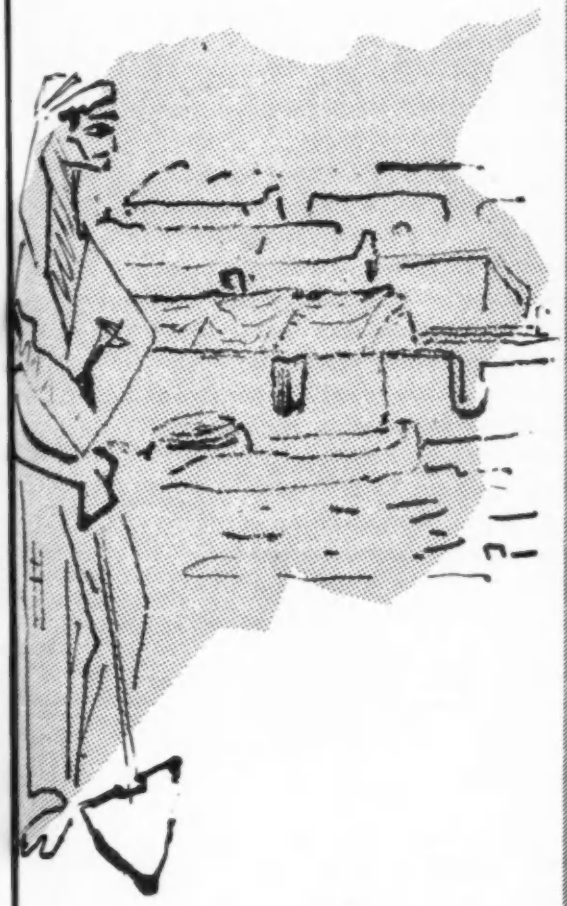
7. The tasks are so large that they require great efforts on a national scale. But as yet they have not been met by the proper policies. We can state very definitely that in most developing countries there is a complete lack of national policies and national programs to provide for the necessary allocations of public funds and mobilization of private resources to meet their housing problems.

8. This is largely due to a lack of understanding of the role of housing in the development of the country in programs of economic development. People overlook the human factor, they consider only directly productive sectors of the economy and consequently overlook the social and human problems of displaced, dissatisfied people who hinder the successful implementation of overall development programs.

9. Great expenditures have been involved in the creation, maintenance and operation of housing projects of the wrong kind. The people who started them, become discouraged by the colossal cost involved and the people living in them disillusioned, because these projects are never completed due to lack of financial means. We know of many cases where the authorities which created such expensive projects, have never completed them; we know of other cases where completed projects were passed over to municipal authorities that were unable to maintain them.

10. These practices result from the lack of trained people to face the problems of developing countries; people able to look at the overall problem. Thus the planner or the man who replaced him, because of the lack of trained planners, tries to copy old Western cities, which he has seen in books and magazines. He overlooks the fact that financial, economic, climatic and other conditions, are completely different.

11. This brings us to another point: namely, the lack of proper designs, adjusted to the climate and the economy of a country. The tendency to copy Western patterns, which are really patterns of north-western Europe, in countries which have completely different conditions, is creating insurmountable problems for people who thus find themselves in a new environment, much more expensive than it should be, and serving their needs much less than it should. So people again become disillusioned; authorities become disappointed and think that the problems cannot be met.



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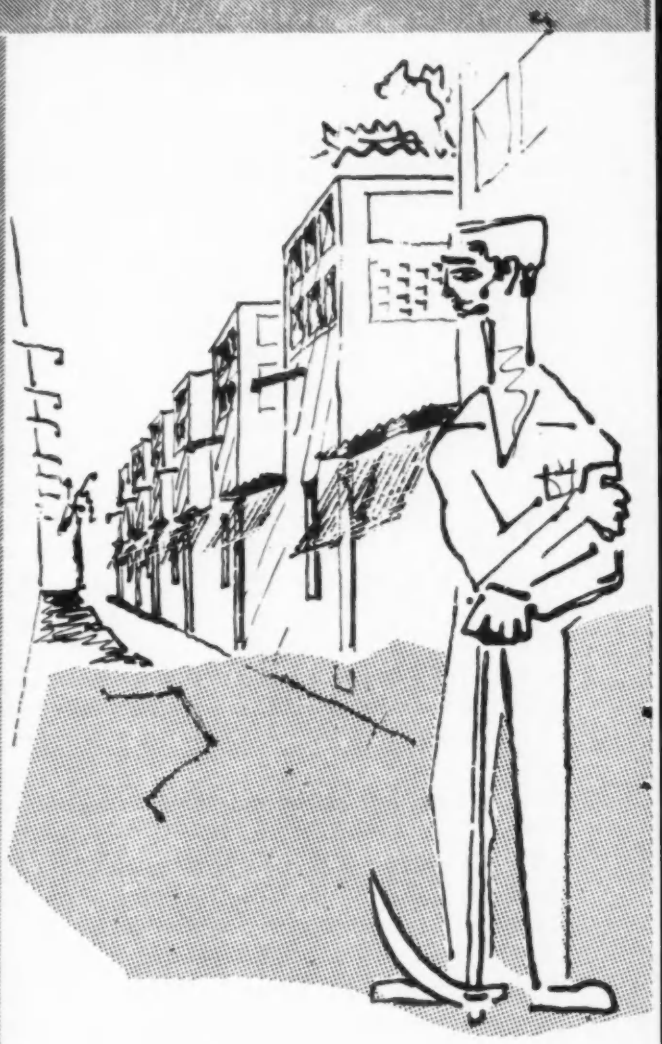

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Comfortable houses for labourers lead to an increased output

12. Finally, we have to state that there is a lack of understanding of the use of local materials as soon as attempts of housing begin. People tend to build houses corresponding to Western specifications, produce bricks according to Western standards, follow types of construction and imitate materials produced in other countries for completely different conditions. The very fact that, even in countries which require very simple walls with continuous ventilation through them, attempts have been made to build low-cost houses with heavy brick walls, shows how wrong conceptions often are of the real problems and the methods by which they can be met.

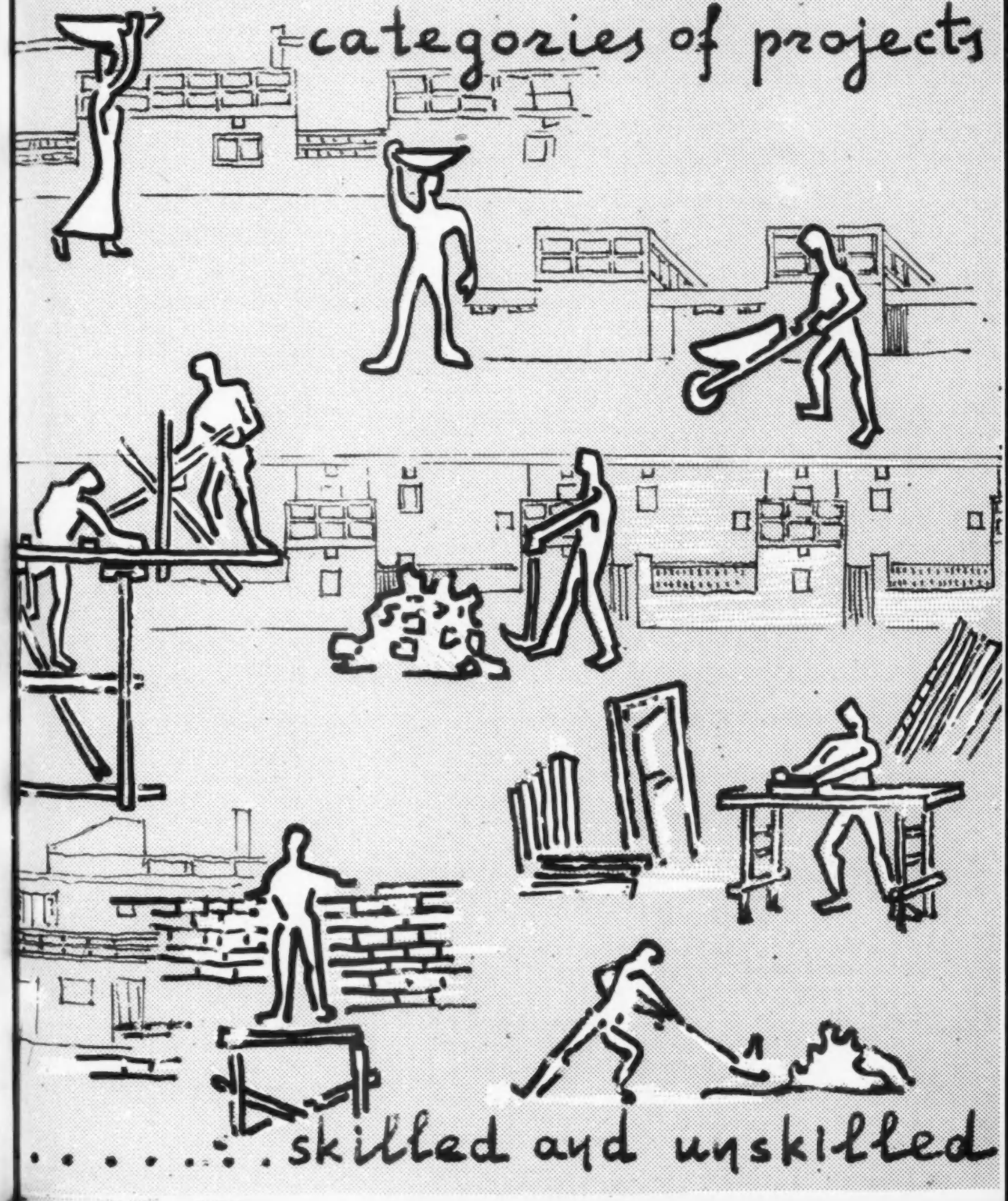
13. The economic planners who are usually in charge of the economic development of development countries overlook the size of existing investment in housing and settlements and pay very little attention to this whole sector which they leave without any guidance or plan. But the investment in the whole field of housing is very big. Actually the less developed the country the bigger the investment, in proportion to the other sectors, as capitalists in underdeveloped countries invest practically nothing in industry, and very small amounts in transportation and communication. Actually, the whole of private investment goes into agriculture, housing and human settlements. Thus the greatest natural sector of investment is overlooked by economic plans, left without any control and, usually when development starts, more is spent on large numbers of luxurious houses, which contribute very little to the solution of the problem.

14. There is a legend that when economic development starts, investment in housing drops. This is not true, however. Investment in housing may fall proportionately in other sectors but it will increase in absolute figures continuously, even without any guidance, even without any assistance from the government.

15. One of the most characteristic examples of the lack of understanding of human aspects and the lack of social planning, is the fact that frequently land is left in the complete ownership of big landowners who, when they recognize the trend towards big cities and industrial centers, raise the prices of the land and, by this mere fact, become the enemies of organized housing efforts, as more and more national funds have then to be used for the acquisition of the land and not for the actual construction of houses.

16. Planners and housing designers are either citizens of Western developed countries or native citizens who have been trained in the West. By necessity they have been influenced by alien solutions and they transplant them without due consideration to the completely different conditions which exist in each country. Here we have to state the basic weakness of training planners and designers who don't learn a scientific approach to problems but the techniques of solving problems of the countries in which they are trained. This means that these people become technicians able to work out certain examples of solutions but not scientists able to open new lines of thought and to find appropriate solutions for every case.

Housing employs more local personnel than other categories of projects



.....skilled and unskilled

17. Finally, the increased production of housing which is required, dictates a much greater use of local methods of construction in a better way; much greater standardization; more research and new materials based on local raw materials. This requires a great deal more effort and research than is done. Hence great local resources, materials and skill, remain unexploited.

C. EKISTICS, THE SCIENCE OF HUMAN SETTLEMENTS

18. There is undoubtedly a need for a new approach. The approach should not be technical, should not teach us a certain technique of "how to build a house" or even how to set a layout under certain conditions but the scientific approach, because conditions differ from country to country, from region to region, from time to time, from specific project to specific project. Our approach should be scientific; it is the scientific approach that we need; the approach which will allow us to recognize situations and then find the appropriate solutions and not the technique which will teach us how to apply known methods.

19. Ekistics is the science of human settlements. Ekistics should open up to us a road for the solution of housing problems. It begins by looking at the housing effort simultaneously as a whole and as part of a national effort for development.

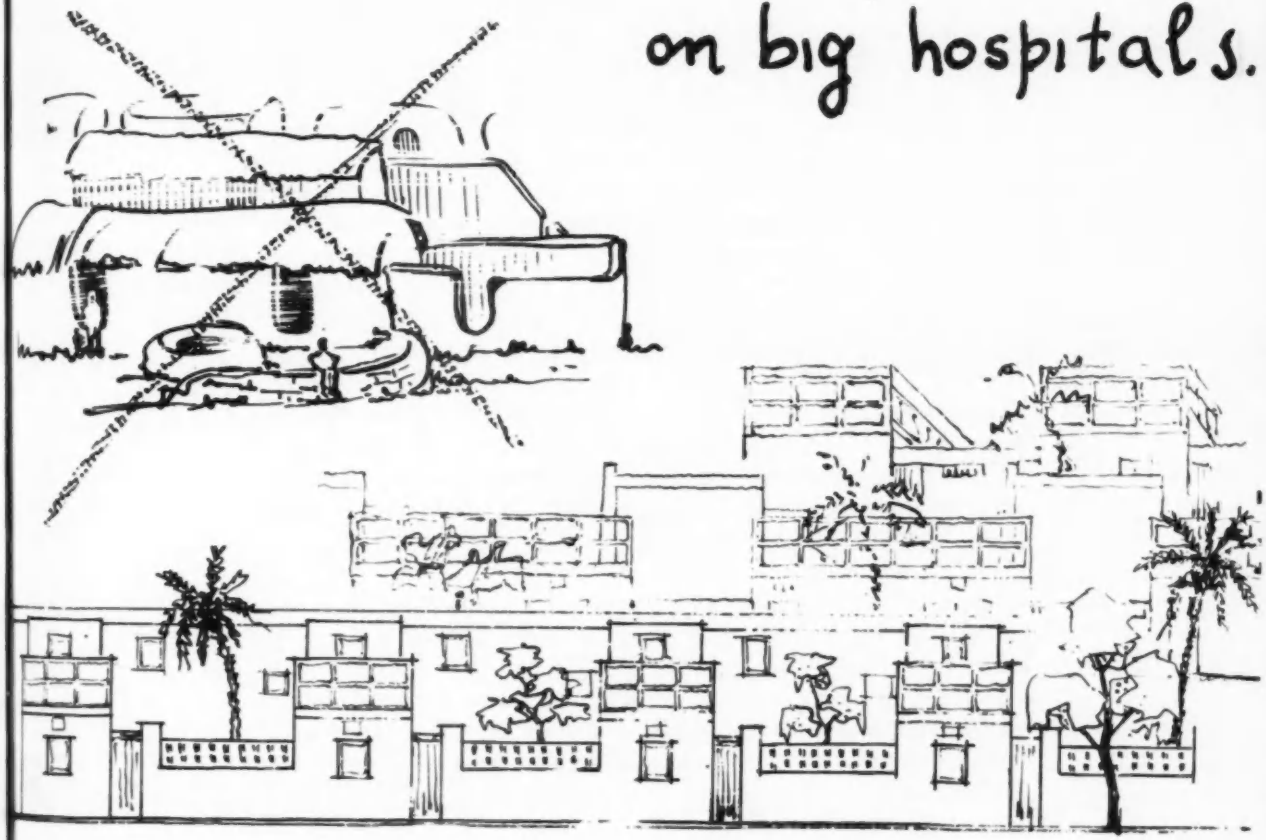
20. Ekistics connects development, which is the cause of housing problems, with housing itself. It guarantees that a policy will start from a statement of main causes and assures that the resulting effort will be effective. Ekistics by conceiving the whole can give directives for each effort to be made within it.

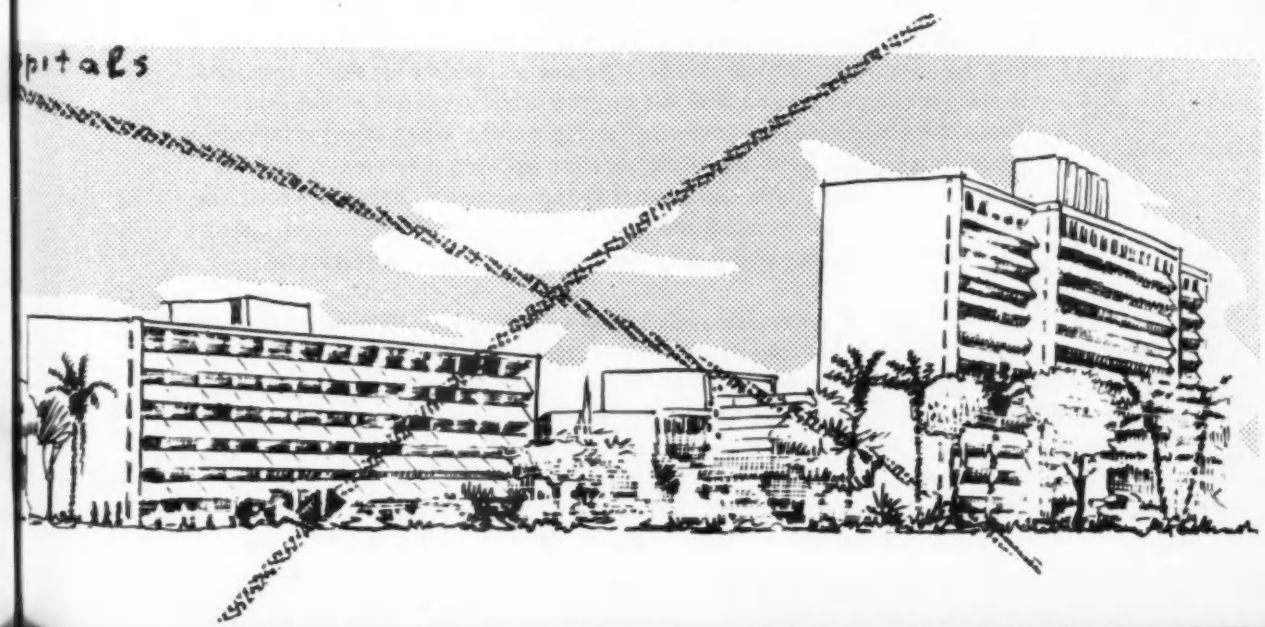
21. A proper share of available resources should go into housing. It does not help to say that housing is non-productive. This is very naive. Housing like everything else has to get its share of the national effort. If it gets less than its share then there is a lack of proper balance and we have disturbances and dissatisfaction of the people; we have socially displaced persons, we have unrest, we have an upsetting of that very economic effort which was our primary goal.

22. If on the other hand, more is given for housing than the proper share then there will be a delay in economic development because resources will have been shifted from other sectors to housing.

23. The question, therefore, is "what is the proper share?" Well, this is something that cannot be answered by a sweeping rule. We must find every time what is the proper share of housing within the national development program. This is the greatest task for Ekistics. If, for example, in one case, housing is inadequate and the country is not yet prepared to consider industrial development then maybe this country should start by dedicating a big effort to housing. If, on the other hand, the goal is immediate industrial development, then we should proportion housing to

More and better houses will decrease the -expenditures on big hospitals.





those new industries which are being set up in new places in order to serve the new labor force which will be needed to serve the new industries.

24. Housing is also a sector where one can achieve a better balance of existing resources to imports. In housing we can study many more types of solutions than are possible in setting up an industry. You cannot create an industry in a developing country without importing a great part of the equipment from abroad, but in houses you can always select between a solution based only on local materials (after all, people have been building houses without imported materials for centuries and centuries) and houses requiring building materials from abroad. A housing program enables one to regulate the amount of funds in foreign exchange to be spent on this sector and how much for other sectors.

25. Although it is often not recognized, a housing program is especially necessary at the beginning of projects of economic development. The reasons are the following:

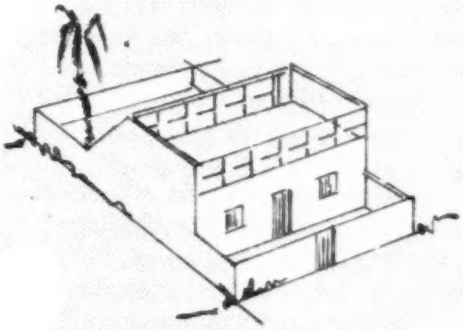
a. New development involves movements of people towards new cities and new places, and new housing in the proper place can facilitate their permanent settlement near the industrial centers, etc., make them happy and attract them to new irrigated areas, in newly-settled lands.

b. Housing is also necessary at the beginning of the program in order to mobilize more easily the human resources of the country. It is much easier to mobilize people to build their own houses than to mobilize them for big public projects. A house being an item of personal property, every person can afford the labour to build it without complaints, if he sees that he is going to use it directly for his family. A big project does not appeal to him in the same way at all.

c. Housing is also indispensable at the beginning of a program in order to train people for higher skills. Actually the simpler skills required in an overall development effort are the skills required in housing. These are simpler skills required for big public works and for industries. Housing is a very good workshop to start training a farmer to become a skilled labourer. We can start training masons to become fitters, by teaching them how to make electric installations within houses, and then select the more highly-skilled for complicated installations.

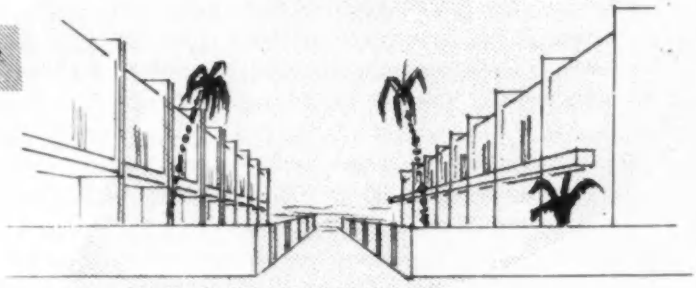
26. In the preparation of economic programs we have to decide how much money for housing will come from private people, in a combination of capital and labour, and how much from the government. It is here that we can regulate the market of available labour resources to serve these schemes. Some excellent rural schemes may have no value if not combined with improvement of existing houses and the creation of new ones.

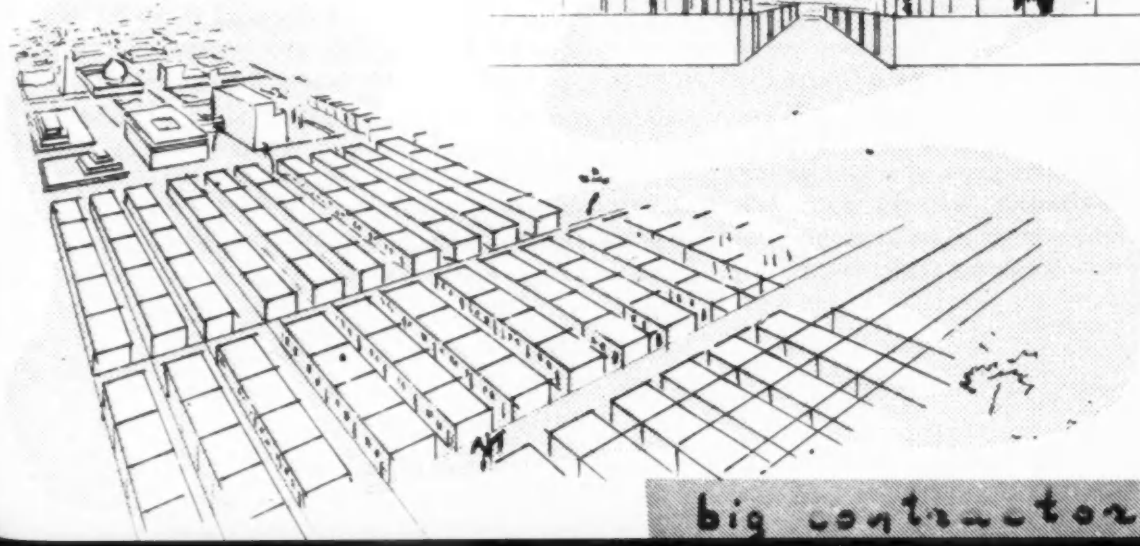
Housing can provide jobs for all the local contractors and gradually train more . . .



minor contractor

medium contractor





big contractor

27. An urban land policy should be worked out within the frame of the overall national development plan. Land prices in the urban areas should not be permitted to rise and defeat every effort of housing as it has happened in many countries.

28. Ekistic requirements impose certain social policies, e.g., the acquisition of urban land at reasonable prices. Ekistic policies should be the main initiator of urban land reform. There is much talk in all developing countries about rural land reform but it is urban land reform which is the key to many of their national problems.

29. Let us not forget that the goal is always human interests, and not merely the construction of houses. Sometimes it may be better to build only parts of houses for 10 families than one complete house for one family. We should not start by conceiving a house and then finding how we can build it. We should start by conceiving the economics of a society, the social goals of the society at a given moment, and then see how the goals can be achieved by mobilizing and utilizing all resources for the largest possible number of people.

30. Once we consider the dynamics of housing developments and begin to look at everything through the time factor, it becomes possible to understand the changes which take place in the geographical distribution of settlements. It is impossible to have development in any area without having continuous dynamic changes in the settlements, their size, their interrelationship, their contents and their structure. It is essential to understand these changes in advance in order to serve any area with housing programs.

31. Some of the most important changes are changes of market centers. Even without the creation of new settlements, without the creation of any new economic functions like industry and mining, rural settlements in a certain area will undergo changes in the importance of the market centers because of their natural development. Because of new means of transportation the distances between them acquire a different meaning. Whereas in the past people had to walk or ride on horseback or on camelback to a market center, 15 or 20 kilometers from their villages, with the same effort and within the same time, by new means of transportation they can now reach market centers up to 80 or 100 kilometers, which means that some market centers are losing in importance, whilst others are gaining. It is therefore essential to understand the whole pattern of marketing and the area served by the markets in order to understand the new problems likely to arise, the declining settlements, the upcoming settlements, etc.

32. Programs of action have then to be decided according to the new patterns of settlements it is desired to develop. This makes it necessary to understand the character of every area and the phase of development which its settlements are going through at any given moment.

33. These types and phases of areas can be classified in the following categories:

a. Areas which are developing and where development is justified economically.

b. Areas which are developing but where development is not justified economically and will not continue.

c. Areas which are stable and where this stable position is justified.

d. Areas which appear stable but whose stability is not justified and will be upset later, upwards or downwards.

e. Areas which are depressed and this is economically justified because there is no possibility to develop them economically.

f. Areas which are depressed unjustifiably simply because they have been overlooked, have not been aided and where natural potentials exist which could create a much more important development later and turn them from depressed into fast-developing areas.

34. It is obvious that policies have to be decided for every such area in a different way.

35. Just as we have to approach the problem of regional programs without limiting ourselves to physical plans so we have to approach the problems of the development of cities with major long-term programs which will define the trends of population and of the economy, before proceeding to anything related to the physical development of a city. In this way we can be led to programs arising out of the needs of the city and expressing its possibilities for development.

36. A basic problem which arises when designing for the developing areas is the problem of cost. We have certainly to know the budget of the city, the budget of the community, of the family or of the school committee for each corresponding project. We have to estimate how much can be spent now and how much in the future. If we decide to be realistic then we have to face the following dilemma: if we design the project to correspond to present incomes and budgets, then the project will very soon be surpassed by natural evolution in a developing economy; it will be too small and not serve its purpose any more. If on the other hand we base our estimates of cost on future possibilities of financing, we create a project which either:

a. will be impossible to finance, or

b. even if it is financed, will prove uneconomic because it will not be economically in balance with the people who are using it.

37. Consequently, in developing countries we must decide to plan for the future but to build for the present. This means that we must conceive big and construct small, we must think every time how many years the house is going to last, how many years a road is going to last, how much of it can reasonably be built now, and how much could be justified in five, ten or fifty years.

38. In this connection we must remember that most of the facilities, especially the houses, exist already locally and, if we want to be realistic and adjust our new projects to the existing economic conditions, we must think more of the evolution of local types of houses than of a revolutionary change which is really impossible if there is no corresponding revolution in the economics of the area, in the social habits, in the technical possibilities, etc.

39. When designing, we have to consider the basic fact that we must develop what is healthy in the country. Our role, really, should be the role of an archaeologist who digs fast to find what already exists there, and then the role of a farmer who plants a tree and looks after its growth. We have to be sure that the right seed is planted and that the gradual growth of housing is then tended as one of the natural expressions of the country and the people as a whole.

40. We have to study the possibilities existing in the country and use them in the best possible way. We have to use local materials and methods and develop them gradually, since we have to be sure ourselves about the best type of development (not learning it from abroad) and we have to convince the total labour force to follow this evolution of techniques.

41. This poses a big problem: What will be our position vis-à-vis experience gained abroad. There is no question that we have to use this in the best possible way, but we should not transplant the findings in the way they would have been implemented in another country. We should study what has already happened in other countries and see in what way we can adjust it to the country we are concerned with.

42. Here again we must use every type of experimentation as much as possible and carry out all possible research. There is one point, however, that we have to insist upon in this question of research. Very often in new countries research is started from the very beginning on problems which have already been encountered in other countries. We stress the point that in most cases the best type of research starts in a library and the first people working on research programs should accumulate and use the experience gained already in other countries before deciding upon new lines of research or experimentation for the developing country. I have seen so many cases

of experimentation and research undertaken upon problems already answered that I have to insist on the importance of evaluating the experience already gained before proceeding to new experiments.

43. We know that some good projects exist as well as some bad projects but we know of no cases where a whole country has really reformed its housing conditions. Failure is usually caused by its small scale, but there are also failures of quality in the projects themselves and often it is the failure in quality that leads to a failure in scale.

44. Without Ekistics, without the overall study of the problem, even more precious time will be lost. Travelling around the world I have seen first-rate technical experts, struggling to face huge problems, struggling to pit their technical knowledge against an essentially economic and social problem, trying to face a peculiarly local problem with the techniques acquired abroad in other environments under different conditions. I will mention one simple example as a final instance: I have seen people wondering why the people of most hot countries still insist on insulating roofs with a layer of earth and not with lighter materials. And these experts have never stopped to multiply the quantity needed of the lighter and so-called cheaper material then recommended by the enormous number of houses which have to be built. They have not estimated the terrific cost of transporting these materials (even if they were given as a free gift to the people) up to villages in mountains or deserts. It is so obvious that in countries where people have been using earth for their houses for thousands or years, this may still be a good solution especially in the most remote areas, even if we do know that technically much better and much lighter materials exist.

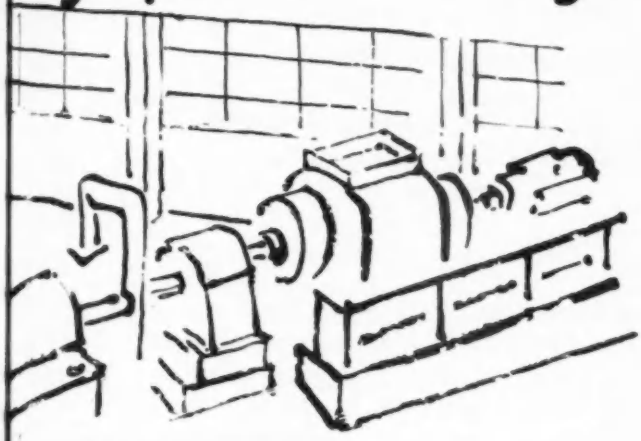
45. - Is housing a productive investment?

- Is it not a luxury?
- Does housing increase labour output?
- Is housing an item of high priority?
- Is housing an important part of a development program?
- Should not housing be left to the private citizen?
- Should it be the concern of the Government?

46.

- Yes, housing is a productive investment, at least as productive as any other investment under a well-balanced program.
- No, it is not a luxury. It is indispensable.
- Yes, more than any other investment.
- Yes, housing is in many cases an item of very high priority.
- Yes, housing is a very important part of the development program.
- No, housing cannot be left to the private citizen alone--it is too late.
- Yes, it should be the concern of the Government since otherwise the problem will never be solved and even private initiative will yield no results.

Why protect everything but people ?



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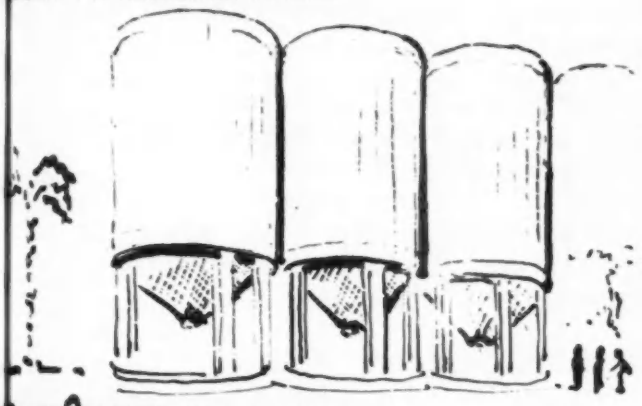

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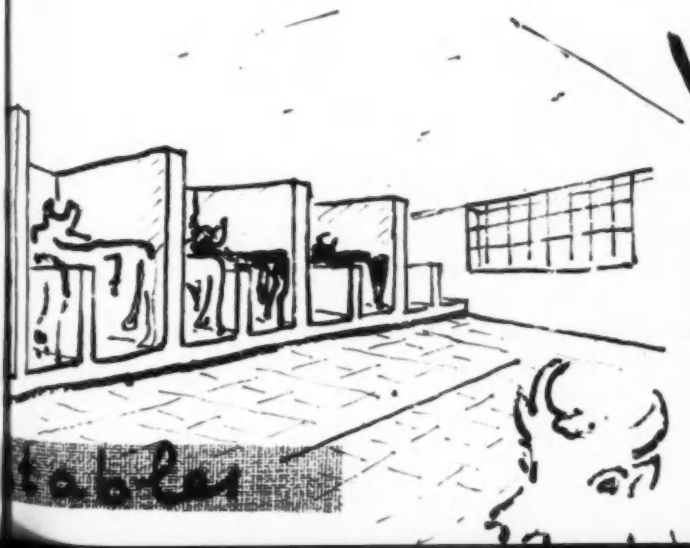
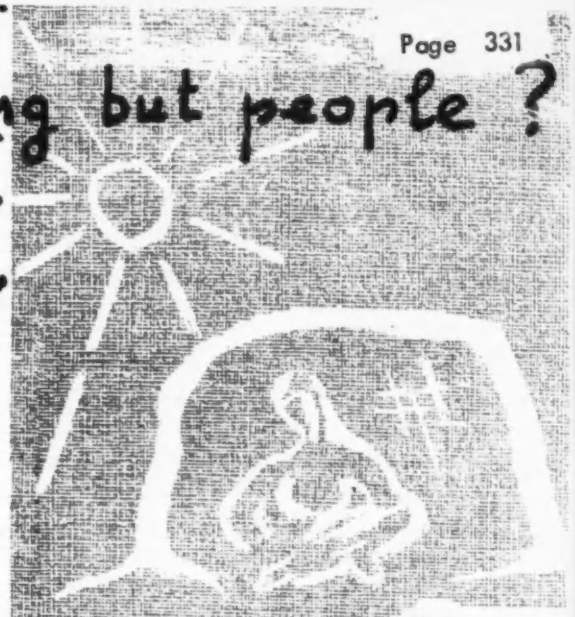


tables



Sun

Rain

Wind

United Nations, Economic Commission for Europe, Housing Committee
UTILIZATION OF SPACE IN DWELLINGS
HOU/Working Paper No. 98, April 24, 1959. 161 pages with appendices. Illustrations.
643: 728 (4)

1. Reference to this study has been made in Ekistics no. 7:29 pages 78-79 and 7:40 page 134. The following is an abstract of a provisional version of the report on Utilization of Space in Dwellings, prepared by Mr. M. B. Blackshaw (United Kingdom) in consultation with Mr. M. Lebegge (Belgium) and Mr. R. Blokhine (USSR), and in collaboration with Mr. L. De Vestel (International Union of Architects). While their study deals with an analysis of space in dwellings in Europe only, the technique of this report and the analysis of various spaces is of interest throughout the world. It is such analyses of utilization of space, that may point out pitfalls and guides for the planning of future housing.

2. Analysis by function. The comparative analysis of dwellings on the basis of the functional use of space is a complicated matter. The amount of space required to perform various household and other functions has been the subject of considerable research in many European countries. Similarly extensive studies have been undertaken on the space needed for items of equipment and furniture and room for movement around them. These studies have usually been based on certain standard sizes for furniture and equipment but these naturally vary somewhat from country to country.

3. The designer of a dwelling ought to have a clear picture in his mind of the functions to be performed and the furnishing in each part of a dwelling before its internal arrangements and the size of rooms can be determined. It does not necessarily follow that a family occupying the dwelling will use the rooms as intended. But, in order to carry out any reasonable analysis there must be some common basis of approach. The basis adopted in this report is that of the "designer's criterion" and the questionnaire was framed with this object in view.

4. A further important aspect of any functional analysis is the timing of functions. This particularly applies to rooms purposely designed to perform a variety of functions which are carried on consecutively or simultaneously or any combination of the two. In theory the need for extra space in multi-purpose rooms where two functions are carried on consecutively ought to be minimal, provided the furniture is appropriately designed for a dual purpose, e.g., a child's bedroom used also for daytime study. However, in the case of rooms where functions are to be performed simultaneously some extra allocation of space for the additional function would be reasonable.

5. An attempt has been made to establish whether in practice there is any relationship between room sizes and the timing and type of function.

6. The questionnaire. The questionnaire was drawn up by the rapporteurs to obtain data on the following matters:-

(1) The current standards of room sizes and overall areas prescribed for low cost housing;

(2) The current regulations and codes governing ceiling heights, sanitary equipment, facilities for cooking and laundry, storage space, staircases and heating;

(3) Plans of recently constructed dwellings covering the following types:-

Type A. A dwelling on one floor (flat or bungalow) with one bedroom designed for an aged couple.
Type B. A flat in a block without a lift (or a two story house) designed for a family of 4 persons and built in an urban area.
Type C. A flat in a block served by a lift (or a two story house) designed for a family of 5 persons and built in an urban area.
Type D. A flat or a two story house designed for a family of 7 persons.
Type E. A house designed for a family of 5 persons and built in a rural area;

together with a complete description of the equipment installed by the builder and by the tenant and the mode of living for which the dwelling was designed. A model reply was attached to the questionnaire. Replies were received from 26 governments.

7. Definitions. The rapporteurs agreed to adopt, for the purpose of the report, the following rules for the measurement of dwellings:-

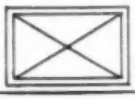
(1) Useful floor space

(a) for dwellings on one floor in a multi-family house--the area of the dwelling measured within the enclosing walls including private balconies, but excluding all communal staircases, passageways or corridors.

(b) for single family houses--the area within the enclosing walls measured on all floors (excluding basements and cellars) and, in the event of habitable rooms formed in an attic, only the area that is about 1.5 meters in height.

(c) for "Duplex" houses with an external staircase to the upper floor, the area of the staircase is excluded.

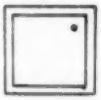
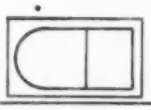
(2) Living floor space is the total of the net areas of living room, sitting room, play room, kitchen and bedrooms. Each room to be measured net within the enclosing walls, without deducting chimney projections, and including the area of any cupboard opening from the room or any private balcony.

Chaudière	Central heating Boiler	Установка /котелок/ центрального отопления	
Poêle en fonte	Metal stove	Печь чугунная	
Poêle en céramique	Tiled stove	Печь кирпичная	
Cuisinière à charbon	Solid fuel cooker	Дровяная или угольная плита кухонная	
Cuisinière à gaz	Gas cooker	Газовая плита кухонная	
Cuisinière électrique	Electric cooker	Электроплита кухонная	
Générateur d'air chand	Hot air plant	Установка для воздушного отопления	
Radio	Radio	Радио	
Télévision	Television	Телевизор	
Ascenseurs et monte-charge	Lift and goods hoist	Лифт	

Remarques: (1) Le mobilier ou le matériel incorporé par le constructeur se représente en traits pleins. Le mobilier ou le matériel incorporé par l'occupant se représente en pointillés.

Notes: (1) Equipment, fittings and cupboards incorporated in the dwelling should be shown by lines; equipment, fittings and furniture provided by the occupant should be shown by dotted lines.

Примечание: (1) Мебель и материал, включенный строителем, указывается полной чертой. Мебель и материал, включенный жильцом, указывается прерванной чертой.

W.C.	W.C.	В.К.	
Bidet	Bidet	Бид.	
Tub de douche	Shower bath	Душ	
Baignoire fauteuil	Sit bath	Ванна для сидения	
Baignoire	Bath	Ванна	
Lavabo	Lavatory basin	Умывальник	
Evier simple	Sink	Мойка-раковина	
Evier simple avec égouttoir	Sink with single draining board	Мойка	
Evier double avec égouttoir	Sink with double draining board	Двойная мойка	
Chauffe-eau	Hot water heater	Водогрейная колонка в ванной или кухне	
Lessiveuse	Washboiler	Стиральная машина	
Frigo	Refrigerator	Холодильник	

(3) Service floor space is the total of the net areas of bathroom, W.C., utility room, laundry, fuel store, and storage space.

(4) Circulation floor space is the total of the net area of any hall, lobby, landing, staircase, corridor or passage within the dwelling.

8. Identification of rooms. It was essential to devise a common method for identifying rooms and spaces within dwellings and to ensure that the symbols used would clearly indicate the principal purpose of such spaces and, in the case of any multi-purpose room, the subsidiary function or functions for which it was designed to be used.

9. The method adopted throughout the tables and plans reproduced in this report has been to indicate by Roman numerals the principal purpose of the various spaces within dwellings and by Arabic numerals their subsidiary functions, as follows:-

Principal Purpose		Function	
I	Living room	1	Recreation and reading, etc.
II	Kitchen	2	Cooking
III	Dining room	3	Eating
IVa	Parent's bedroom	4	Sleeping
IVb	Children's bedroom		
V	Play room	5	Play or study
VI	Bathroom	6	Washing (personal)
VII	W. C.	7	W. C.
VIII	Laundry	8	Washing (clothes)
IX	Circulation	9	Circulation, storage, sundry
X	Storage		
XI	Terrace, Balcony and Loggia		

10. SUMMARY OF RESULTS. The results show extremely wide divergencies in respect of the size of dwellings and there seems to be no logical reason for this. Some of these differences are due to the adoption of various planning principles which in turn affect the amount of circulation floor space and there are wide variations in the amount of floor service space and, in particular, storage space. The extent of the latter doubtless is influenced by climatic conditions and the degree of isolation of the dwelling from normal supplies and services. But the most remarkable result of this enquiry is the wide differences which exist in the amount of living floor space provided in dwellings in each of the five categories.

11. The following table indicates the maximum and minimum living floor space in M^2 in each of the five categories of dwelling:-

TABLE B. Living Floor Space in M^2

	Type A Flat for Aged	Type B Flat for 4	Type C Flat for 5	Type D Flat for 7	Type E House for 5
Max.	48.2	82.3	97.9	104.7	96.8
Min.	17.4	35.9	49.5	60.6	42.9

TABLE C. Living Space per person in M^2

	Type A	Type B	Type C	Type D	Type E
Max.	24.1	20.6	19.6	14.9	19.4
Min.	8.7	9.0	9.9	8.5	8.5

12. In the above Tables Type C and Type E dwellings are both designed for five persons and it will be noted that there is a progressive increase in the amount of living floor space per dwelling with each increase in the number of persons for whom the dwelling was designed. This is to be expected. On the other hand, there is a progressive decrease in the amount of living floor space per person as the dwelling size is increased to take larger families. The main interest in these tables, however, is the difference between the maximum and minimum figures, since in each case they represent what space is being provided in dwellings in various countries for normal families with much the same needs.

13. The same order of divergence is discernible if the living space is further broken down into the aggregate areas for living rooms and kitchens on the one hand and bedrooms on the other. For this purpose Type A (Flat for Aged Couple) has been omitted from the tables as this does not represent a "family" type of dwelling in the true sense. In the following two tables the figures given are exclusive of private balconies and do not include dwellings where the living room is used for sleeping purposes. The figures in brackets represent the living floor space per person.

TABLE D. Aggregate areas of living rooms and kitchens in M^2

	Type B	Type C	Type D	Type E
Max.	46.3(11.6)	36.5(7.3)	(49.5(7.1)	(46.9(9.4)
Min.	16.0(4.0)	17.0(3.4)	(20.5(2.9)	(16.1(3.2)

TABLE E. Aggregate areas of bedrooms in M^2

	Type B	Type C	Type D	Type E
Max.	32.3(8.1)	60.2(12.0)	55.3(7.9)	53.0(10.6)
Min.	16.1(4.0)	25.5(5.1)	34.3(4.9)	22.8(4.6)

14. These tables show that "day space," as represented by the aggregate area of living rooms and kitchens combining the functions of recreation, cooking and eating, shows wide differences and the amount of space per person ranges from 2.9 M^2 (Type D) to 11.6 M^2 (Type B). Similarly, in the "night space," as represented by the aggregate area of bedrooms, the amount of space per person ranges from 4.0 M^2 (Type B) to 12.0 M^2 (Type C): a difference of 8.7 M^2 per person in "day space" and 8.0 M^2 in "night space."

15. The above differences tend, however, to be accentuated by the inclusion of data relating to exceptionally small and very large dwellings within the various categories. In order to give a truer picture of these variations the following two tables have been prepared to indicate the number of examples of dwellings of each category grouped according to size at 5 M^2 intervals.

TABLE F. Aggregate areas of living rooms and kitchens

Area in M^2	Type B Flat for 4	Type C Flat for 5	Type D Flat for 7	Type E House for 5
16-20	1	1	0	2
20-25	9	8	2	5
25-30	7	4	5	7
30-35	2	7	5	4
35-40	1	0	4	1
Average	26.5 M^2	28.0 M^2	32.7 M^2	27.8 M^2
Average floor space per person	6.6 M^2	5.6 M^2	4.7 M^2	5.6 M^2

16. Tables F and G indicate that the reduction in the amount of living floor space per person, as the dwelling size is increased to take large families, is due principally to the reduction in "day space" ; that there is a remarkable degree of consistency in the average amount of bedroom space per person throughout all dwelling types; and that there is almost exact consistency between urban and rural dwellings designed for five persons.

TABLE G. Aggregate areas of bedrooms

Areas in M^2	Type B	Type C	Type E	Type F
16-20	3	0	0	0
20-25	8	0	0	2
25-30	6	8	0	8
30-35	4	8	1	6
35-40	0	4	6	2
40-45	0	1	6	1
45-50	0	0	3	1
Over 50	0	0	3	1
Average	25.1 M^2	31.9 M^2	42.0 M^2	32.2 M^2
Average floor space per person	6.3 M^2	6.4 M^2	6.0 M^2	6.4 M^2

17. Functional Analysis of Day Spaces. There are four principal daytime functions affecting living rooms and kitchens, namely, the preparation and cooking of food, eating, recreation, and children's play and study.

18. Analysis of the plans and the written answers to the questionnaire indicate that in very many instances there is no precision as to the allocation of space for the two functions of eating and children's play. In the former case it is very common for dining tables to be shown both in the kitchen and in the living room and this duplication of space for one function complicates the analysis of the data. Furthermore, the question of children's play space and study has brought forth a variety of answers. The general inference is that, with few exceptions, it is intended that the children's bedrooms should be used for this purpose, but in fact children do perform these functions sometimes in their bedrooms and sometimes in the living room and kitchen.

19. Accepting that children's bedrooms are usually intended for children's play and study, the analysis of living rooms and kitchens in family houses (Types B to E) resolves itself largely into the question of where eating takes place, since without exception the kitchen is used for the preparation and cooking of food and the living room is used for recreation.

20. Table H is devised to indicate the extent to which there is a difference in the aggregate area of living room and kitchens according to where the meals are eaten. Category 1 is where the living room is reserved for recreation and meals are prepared and eaten in the kitchen and category 2 is where the meals are eaten in the living room and the kitchen is reserved for food preparation and cooking.

TABLE H. Areas in M^2

	Type B	Type C	Type D	Type E
Category 1				
(a) Living room: Recreation only	20.8	20.3	22.1	20.0
(b) Kitchen: Cooking and eating	9.7	10.3	10.6	10.0
Total	30.5	30.6	32.7	30.0
Category 2				
(a) Living room: Recreation and eating	18.8	20.5	24.5	20.3
(b) Kitchen: Cooking only	6.4	7.2	7.1	7.8
Total	25.2	27.7	31.6	28.1

The above figures show that, based on averages, there is a discernible pattern which is reasonably consistent throughout all dwelling types. The points that are particularly worth noting are as follows:

(a) The aggregate area of space for the functions of food preparation, cooking, eating and recreation is less where the living room is used for eating.

(b) There is no appreciable increase in the size of living rooms used for eating purposes over those used solely for recreation.

(c) The size of dining kitchens increase progressively in urban dwellings designed for four to seven persons but the increase does not fully compensate for the extra seating space required round the dining table. Dining kitchens in the rural type are larger than any of the others.

(d) The size of working kitchens remains fairly constant.

(e) The total areas of urban and rural dwellings for five persons (Types C and E) are remarkably similar.

21. In addition to the above points a general study of the data indicates clearly that where laundry is performed in the kitchen (in most cases the laundry is done elsewhere than in the kitchen) there is no perceptible increase in kitchen size. Secondly, where living rooms are also used for sleeping purposes, their size is not greatly above and often below the average. This might indicate that the beds are places of dual purpose furniture designed for daytime as well as night-time use. The cases where the living room is smaller than average and yet is used for sleeping purposes seems somewhat illogical.

22. Functional analysis of "night" spaces. In theory there should only be two variables affecting the size of bedrooms, i.e., the number of persons to be accommodated and whether they are intended to be used for recreation or study. It might be expected that there would be a consistency in the size of bedrooms throughout all types of dwellings according to whether they were parents' bedrooms or children's bedrooms designed for one, two or three children. The following table gives the average size of bedrooms in the various categories.

TABLE I. Areas in M^2

	Type B	Type C	Type D	Type E
Parents' bedrooms	13.3	13.1	13.3	13.5
Parents' bedroom and I child	14.9	18.0	18.1	17.1
Bedroom for 3 children			15.5	
Bedroom for 2 children	12.0	12.5	10.7	11.6
	(10.1)	(10.8)	(9.7)	(10.8)
Bedroom for I child	7.6	8.6	7.7	8.0
	(7.7)	(6.3)	(7.1)	(7.7)

Note. The figures in brackets relate to bedrooms used for sleeping purposes only.

23. The small difference in size between bedrooms that are and those that are not used for study indicates that in all probability dual purpose furniture is used. The fact that the majority of the examples are study bedrooms implies that bedrooms in most dwellings are heated.

24. The figures indicate a very marked consistency in the size of parents' bedrooms which on average vary by only 0.4 M^2 and to a lesser extent in the size of children's bedrooms. The widest differences occur in the case of bedrooms accommodating the parents and one child.

25. Dwellings for aged couples. Adopting the same methods for analyzing the space in dwellings for aged couples as that adopted for family dwellings, the aggregate day space (living rooms and kitchens) exclusive of private balconies and the examples where the living room is also used for sleeping purposes, varies between 17.9 M^2 - 28.7 M^2. There are seven examples within the range 17 - 20 M^2, eight examples between 20 - 25 M^2 and two examples over 25 M^2. The average aggregate area is 21.7 M^2 which gives a floor space per person of 10.9 M^2. The average size of bedrooms is 11.5 M^2 which gives a floor space per person of 10.9 M^2.

26. Comparable figures for day space in family houses range from 4.7 M^2 - 6.6 M^2 per person and night space from 6.0 M^2 - 6.4 M^2. This indicates that in dwellings

for aged couples there is considerably more day space per person than in family houses and slightly less night space. This seems to be a logical result bearing in mind that old people probably spend more of their time at home and need the extra space during the day and in the case of bedrooms there is, of course, no need to provide space for study or a child's bed as is the case in family houses.

27. Service Floor Space. Service floor space is composed of four main items--bathroom, W.C., laundry (where this is in a separate compartment) and storage space. The space needed for the sanitary equipment varies according to whether the bathroom and W.C. are combined or whether they are in separate compartments. The commonest practice is for dwellings accommodating four persons or less to have a combined bathroom and W.C. and in larger dwellings for five persons or more to keep them separate. In dwellings designed for seven persons and rural dwellings for five persons a substantial proportion of dwellings are provided with two W.C.s.

28. Where the bathroom and W.C. are kept separate more floor space is required than when they are combined. There are several examples of combined bathrooms and W.C.s planned in less than 3 M^2 and, where a showerbath is installed, down to as low as 1.9 M^2. There are very many examples of combined bathrooms and W.C.s which exceed in area the total amount of space taken up by separate bathrooms and W.C.s. The conclusion to be drawn from this is that there is little difference so far as floor space is concerned, the deciding factor must be to consider which method is the most convenient for families of varying size.

29. No reliable comparative data can be given on either laundry or storage space. Although there are examples of dwellings incorporating separate laundry and storage spaces the areas of which are included in the comparative tables, they are not sufficient in number to warrant drawing any conclusions.

30. Circulation Floor Space. The amount of circulation floor space varies by as much as 19.4 M^2 (Type E, two story single family dwellings) and in every dwelling type it varies by over 10 M^2. Naturally more circulation space is required in dwellings on two floors than those that are planned on one floor and the latter vary according to the planning principles adopted. Furthermore, there are bound to be wide variations owing to the large differences in the size of dwellings in each category.

31. The following table has been prepared to give the maximum, minimum and average percentages of circulation floor space to useful floor space for each dwelling type, divided as between dwellings on one floor and dwellings on two floors. Basements are excluded from the latter figures.

TABLE M. Percentages of circulation Floor Space to Useful Floor Space

		Type A	Type B	Type C	Type D	Type E
Dwellings on one floor	Max.	16%	15%	13%	13%	14%
	Min.	4%	0%	0%	6%	0%
	Average	8.3%	8.3%	8.7%	9.1%	9.6%
Dwellings on two floors	Max.	-	18%	18%	17%	23%
	Min.	-	11%	11%	10%	10%
	Average	-	14.5%	14.1%	14.2%	16.6%

32. These figures indicate that so far as dwellings on one floor are concerned the average amount of circulation floor space in all types of dwelling is below 10% - the figures ranging from 8.3 - 9.6%. Dwellings on two floors have, as might be expected, a larger percentage of circulation floor space, varying between 14.1% - 16.6%. The difference is principally due to the area taken up by staircases.

33. The zero percentages in the above table for dwellings on one floor (Types B, C and E) relate to the examples from Portugal where the dwellings are planned with no circulation space as such since the bedrooms, kitchen, bathroom and W.C. inter-communicate with the living rooms. (See Illustration, Page 344).

34. Private Balconies. The extent to which private balconies are provided in dwellings in multi-family houses varies enormously. In general there is more generous provision made for private balconies in western than in eastern European countries. Apart from this geographical location, climatic considerations appear to have little bearing on the issue. Generous provision of private balconies is to be seen in the examples from Portugal and Italy in the South and Iceland, Sweden and Finland in the North.

35. Private balconies are usually planned outside living rooms and in this location they vary in size from 2.0 M^2 to 8.1 M^2. To a lesser extent balconies are provided outside kitchens and there are 5 examples of balconies outside bedrooms. Those balconies outside living rooms and bedrooms are generally larger than those outside kitchens, which are planned mainly as utility spaces.

FINLAND

Calculations of Floor Space

Type A

Useful Floor Space 62.9 m^2
Number of persons 2
Living Floor Space I 3 = 31.0 m^2 including XI 6.6 m^2
II = 4.3 m^2
IV a = 12.9 m^2

Total Living Floor Space	= 48.2 m^2	=	76.6% of Useful Floor Space
Service Floor Space	= 8.3 m^2	=	13.3% of Useful Floor Space
Circulation Floor Space	= 4.3 m^2	=	6.8% of Useful Floor Space

Living Floor Space per person = 24.1 m^2
Useful Floor Space per person = 31.5 m^2

M. Tavio, Archt.

Type B

Useful Floor Space 88.7 m^2
Number of persons 4
Living Floor Space I = 31.2 m^2 including XI 4.0 m^2
II 3 = 11.2 m^2
IV a = 13.5 m^2
IV b 5 = 11.2 m^2
IV b 5 = 7.6 m^2

Total Living Floor Space	= 74.7 m^2	=	84.2% of Useful Floor Space
Service Floor Space	= 3.3 m^2	=	3.7% of Useful Floor Space
Circulation Floor Space	= 6.2 m^2	=	7.0% of Useful Floor Space

Living Floor Space per person = 18.7 m^2
Useful Floor Space per person = 22.2 m^2

M. Hakuri, Archt.

Type C

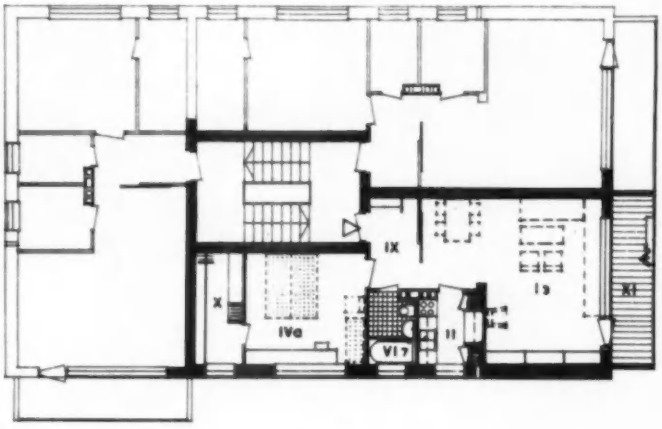
Useful Floor Space 84.5 m^2
Number of persons 5
Living Floor Space I 3 5 = 25.8 m^2
II = 6.8 m^2
IV a = 11.8 m^2
IV b 5 = 10.8 m^2
IV b 5 = 8.0 m^2

Total Living Floor Space	= 63.2 m^2	=	74.8% of Useful Floor Space
Service Floor Space	= 12.0 m^2	=	14.2% of Useful Floor Space
Circulation Floor Space	= 5.1 m^2	=	6.0% of Useful Floor Space

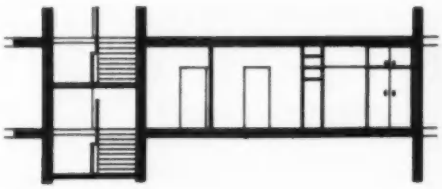
Living Floor Space per person = 12.6 m^2
Useful Floor Space per person = 16.9 m^2

J. Jarvi, Archt.

TYPE A



TYPICAL FLOOR PLAN
PLAN DE L'ÉTAGE COURANT
ТИПОВОЙ ПЛАН КВАРТИРЫ

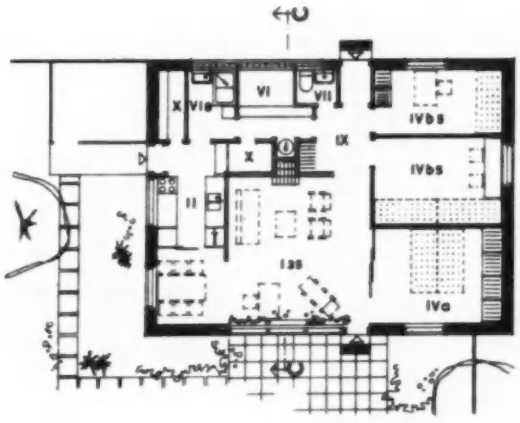


SECTION B-B
COUPE B-B
РАЗРЕЗ В-В

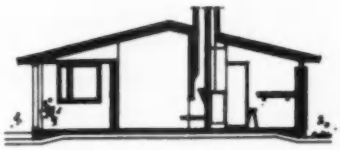
TYPE B

TYPICAL FLOOR PLAN
PLAN DE L'ÉTAGE COURANT
ТИПОВОЙ ПЛАН КВАРТИРЫ

TYPE C



GROUND FLOOR PLAN
REZ-DE-CHAUSSÉE
ПЛАН ПЕРВОГО ЭТАЖА



SECTION C-C
COUPE C-C
РАЗРЕЗ С-С

SCALE IN METRES 0 1 2 3 4 5 6 7 8 9 10

ICELAND

Calculations of floor space

Type B

Useful Floor Space 97.8 M^2
Number of persons 4

Living Floor Space			
	I	= 39.3 M^2	including XI 5 M^2
	II 3	= 12.0 M^2	
	IV a	= 14.9 M^2	
	IV b 5	= 9.4 M^2	
	IV b 5	= 6.7 M^2	

Total		
Living Floor Space	= 82.3 M^2	= 83.9% of Useful Floor Space
Service Floor Space	= 4.4 M^2	= 4.5% of Useful Floor Space
Circulation Floor Space	= 7.4 M^2	= 7.6% of Useful Floor Space

Living Floor Space per person 20.6 M^2
Useful Floor Space per person 24.5 M^2

Type C

Useful Floor Space 104.7 M^2
Number of persons 5

Living Floor Space			
	I	= 28.8 M^2	including XI 7.1 M^2
	II 3	= 11.4 M^2	
	IV a	= 17.0 M^2	including XI 3.2 M^2
	IV b 5	= 11.5 M^2	
	IV b 5	= 9.4 M^2	

Total		
Living Floor Space	78.1 M^2	= 74.6% of Useful Floor Space
Service Floor Space	5.8 M^2	= 5.5% of Useful Floor Space
Circulation Floor Space	13.9 M^2	= 13.3% of Useful Floor Space

Living Floor Space per person 15.6 M^2
Useful Floor Space per person 20.9 M^2

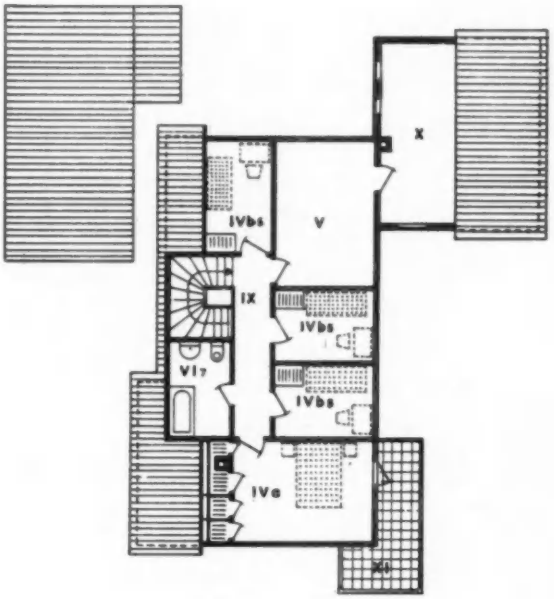
Type E

Useful Floor Space 76.8 M^2
Number of persons 5

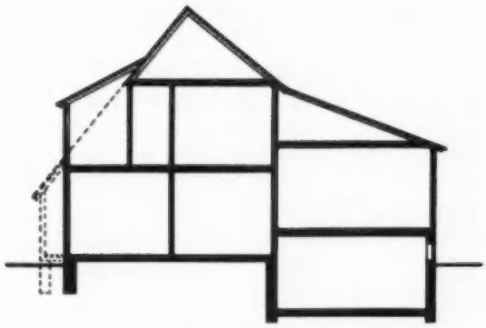
Living Floor Space		
I	= 13.2 M^2	
II 3	= 11.6 M^2	
IV a	= 11.0 M^2	
IV b 5	= 6.2 M^2	
IV b 5	= 5.6 M^2	

Total		
Living Floor Space	47.6 M^2	= 61.9% of Useful Floor Space
Service Floor Space	16.7 M^2	= 21.6% of Useful Floor Space
Circulation Floor Space	7.7 M^2	= 10.2% of Useful Floor Space

Living Floor Space per person 9.5 M^2
Useful Floor Space per person 15.4 M^2



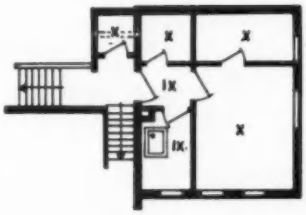
FIRST FLOOR PLAN
PREMIER ÉTAGE
ПЛАН ВТОРОГО ЭТАЖА



SECTION D-D
COUPE D-D
РАЗРЕЗ D-D

TYPE A – D

GROUND FLOOR PLAN



BASEMENT PLAN
SOUS-SOL
ПЛАН ПОДВАЛА

SCALE IN METRES
ÉCHELLE EN MÈTRES
МАСШТАБ В МЕТРАХ

NORWAY

Calculations of Floor Space

Type A

Useful Floor Space	45.6 m^2			
Number of persons	2			
Living Floor Space	I	=	19.5 m^2	
	II 3	=	6.2 m^2	
	IV a	=	9.8 m^2	
Total				
Living Floor Space		=	35.5 m^2	= 77.8% of Useful Floor Space
Service Floor Space		=	5.5 m^2	= 12.1% of Useful Floor Space
Circulation Floor Space		=	2.9 m^2	= 6.3% of Useful Floor Space
Living Floor Space per person		=	17.7 m^2	
Useful Floor Space per person		=	22.8 m^2	

J.B. Kleven, Archt.

Type B

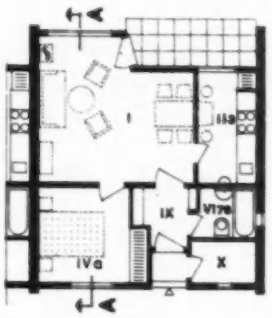
Useful Floor Space	76.4 m^2			
Number of persons	4			
Living Floor Space	I 5	=	27.0 m^2	including XI 5.4 m^2
	II 38	=	9.2 m^2	
	IV a	=	12.4 m^2	
	IV b5	=	6.3 m^2	
	IV b5	=	6.3 m^2	
Total				
Living Floor Space		=	61.2 m^2	= 80.1% of Useful Floor Space
Service Floor Space		=	4.0 m^2	= 5.2% of Useful Floor Space
Circulation Floor Space		=	7.7 m^2	= 10.1% of Useful Floor Space
Living Floor Space per person		=	15.3 m^2	
Useful Floor Space per person		=	19.1 m^2	

Type C

Useful Floor Space	95.3 m^2			
Number of persons	5			
Living Floor Space	I 3	=	30.2 m^2	including XI 4.9 m^2
	II	=	8.1 m^2	
	IV a	=	14.2 m^2	
	IV b 5	=	9.7 m^2	
	IV b 5	=	9.1 m^2	
Total				
Living Floor Space		=	71.3 m^2	= 74.8% of Useful Floor Space
Service Floor Space		=	8.8 m^2	= 9.2% of Useful Floor Space
Circulation Floor Space		=	10.7 m^2	= 11.2% of Useful Floor Space
Living Floor Space per person		=	14.3 m^2	
Useful Floor Space per person		=	19.1 m^2	

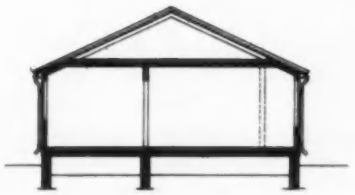
P. Krag and J. Selmer,
Archts.

TYPE A



GROUND FLOOR PLAN
REZ-DE-CHAUSSÉE
ПЛАН ПЕРВОГО ЭТАЖА

SECTION A-A
COUPE A-A
РАЗРЕЗ А-А

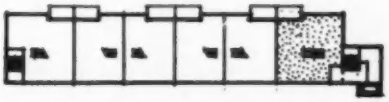


TYPE B

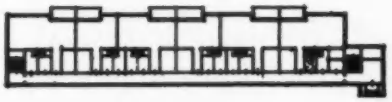
TYPICAL FLOOR PLAN
PLAN DE L'ÉTAGE COURANT
ТИПОВОЙ ПЛАН КВАРТИРЫ

TYPE C

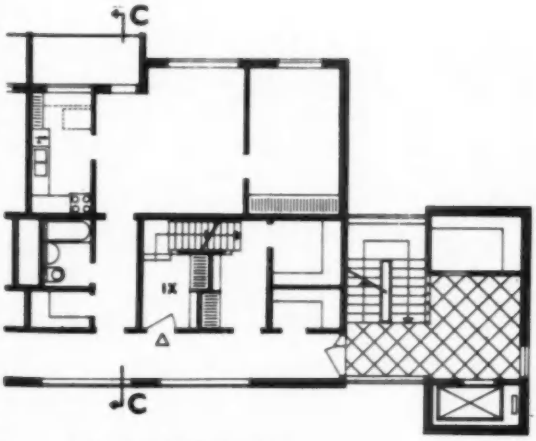
SECTION C-C
COUPE C-C
РАЗРЕЗ С-С



BLOCK PLAN TYPICAL INTERMEDIATE FLOOR
PLAN D'ASSEMBLAGE AU NIVEAU INTERMÉDIAIRE
ТИПОВОЙ ПЛАН МЕЖЭТАЖНЫХ БЛОКОВ



BLOCK PLAN BALCONY FLOOR LEVEL
PLAN D'ASSEMBLAGE AU NIVEAU DE LA COURSIVE
ПЛАН БАЛКОННЫХ БЛОКОВ НА УРОВНЕ ЭТАЖА

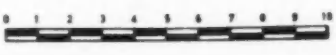


TYPE C

BALCONY FLOOR PLAN
PLAN AU NIVEAU DE LA COURSIVE
ПЛАН ЭТАЖНЫХ БАЛКОНОВ

UPPER FLOOR PLAN
PLAN AU NIVEAU SUPÉRIEUR
ПЛАН ВЕРХНЕГО ЭТАЖА

SCALE IN METRES



PORTUGAL

Calculations of Floor Space

Type A

Useful Floor Space	31.6 m^2			
Number of persons	2			
Living Floor Space	I 3	= 12.0 m^2		
	II	= 6.0 m^2	including XI 8 = 1.7 m^2	
	IV	= 9.0 m^2		
Total				
Living Floor Space		= 27.0 m^2	= 86%	of Useful Floor Space
Service Floor Space		= 1.9 m^2	= 6%	of Useful Floor Space
Circulation Floor Space		= 1.7 m^2	= 5%	of Useful Floor Space
Living Floor Space per person		= 13.5 m^2		
Useful Floor Space per person		= 15.8 m^2		

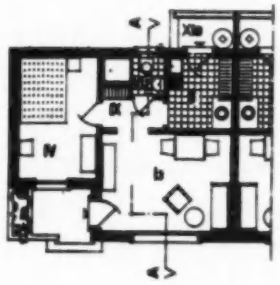
Type B

Useful Floor Space	39.6 m^2			
Number of persons	4			
Living Floor Space	I 3	= 14.3 m^2	including XI = 2.2 m^2	
	II 9	= 5.5 m^2	including XI = 81.6 m^2	
	IV a	= 8.6 m^2		
	IV b 5	= 7.5 m^2		
Total				
Living Floor Space		= 35.9 m^2	= 91%	of Useful Floor Space
Service Floor Space		= 2.3 m^2	= 6%	of Useful Floor Space
Living Floor Space per person		= 8.9 m^2		
Useful Floor Space per person		= 9.9 m^2		

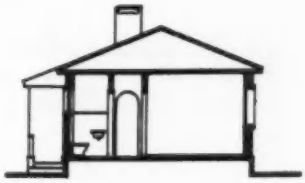
Type C 1

Useful Floor Space	49.8 m^2			
Number of persons	6			
Living Floor Space	I 3	= 14.4 m^2	including XI = 2.2 m^2	
	II 9	= 6.3 m^2	including XI = 81.5 m^2	
	IV a	= 9.0 m^2		
	IV b 5	= 9.0 m^2		
	IV b 5	= 7.5 m^2		
Total				
Living Floor Space		= 45.2 m^2	= 92%	of Useful Floor Space
Service Floor Space		= 2.3 m^2	= 5%	of Useful Floor Space
Living Floor Space per person		= 7.7 m^2		
Useful Floor Space per person		= 8.3 m^2		

TYPE A

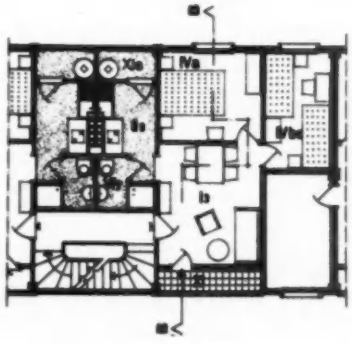


GROUND FLOOR PLAN
REZ-DE-CHAUSSÉE
ПЛАН ПЕРВОГО ЭТАЖА

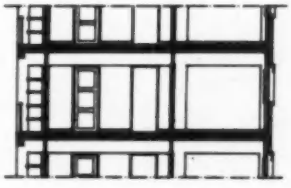


SECTION A-A
COUPE A-A
РАЗРЕЗ А-А

TYPE B

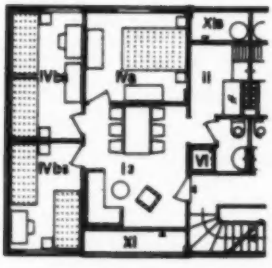


TYPICAL FLOOR PLAN
PLAN DE L'ÉTAGE COURANT
ТИПОВОЙ ПЛАН КВАРТИРЫ



SECTION B-B
COUPE B-B
РАЗРЕЗ В-В

TYPE C*



TYPICAL FLOOR PLAN
PLAN DE L'ÉTAGE COURANT
ТИПОВОЙ ПЛАН КВАРТИРЫ

SCALE IN METRES
ÉCHELLE EN MÈTRES
МАСШТАБ В МЕТРАХ

Turkey

Type C

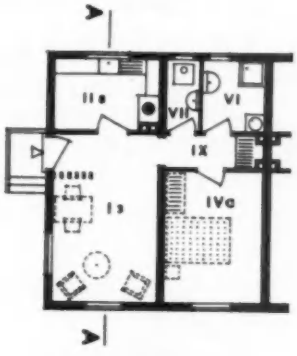
Useful Floor Space	63.1 M^2		
Number of persons	5		
Living Floor Space	I_{35}	= 17.7 M^2	including XI 3.8 M^2
	II	= 5.8 M^2	
	IVa	= 13.7 M^2	
	IVb	= 12.3 M^2	
Total			
Living Floor Space		= 49.5 M^2	= 78.4% of Useful Floor Space
Service Floor Space		= 4.5 M^2	= 7.1% of Useful Floor Space
Circulation Floor Space		= 2.9 M^2	= 4.6% of Useful Floor Space
Living Floor Space per person		= 9.9 M^2	
Useful Floor Space per person		= 12.6 M^2	

Type D NIL

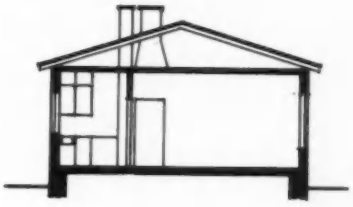
Type E

Useful Floor Space	65.4 M^2		
Number of persons	5		
Living Floor Space	I_{35}	= 17.6 M^2	
	II_8	= 7.1 M^2	
	IVa	= 13.2 M^2	
	IVb	= 12.4 M^2	
Total			
Living Floor Space		= 50.3 M^2	= 76.9% of Useful Floor Space
Service Floor Space		= 7.7 M^2	= 11.8% of Useful Floor Space
Circulation Floor Space		= 3.9 M^2	= 5.9% of Useful Floor Space
Living Floor Space per person		= 10.1 M^2	
Useful Floor Space per person		= 13.1 M^2	

TYPE A

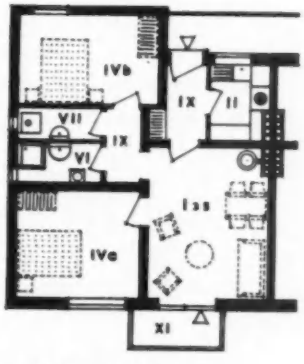


GROUND FLOOR PLAN
REZ-DE-CHAUSSÉE
ПЛАН ПЕРВОГО ЭТАЖА

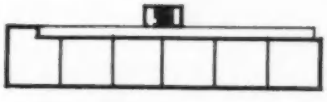


SECTION A-A
COUPE A-A
РАЗРЕЗ А-А

TYPE B



TYPICAL FLOOR PLAN
PLAN DE L'ÉTAGE COURANT
ТИПОВОЙ ПЛАН КВАРТИРЫ



BLOCK PLAN
PLAN D'ASSEMBLAGE
ПЛАН БЛОКОВ

SCALE IN METRES

YUGOSLAVIA

Calculations of Floor Space

Type A

Useful Floor Space	43.6 M^2		
Number of persons	2		
Living Floor Space	I 3	= 17.0 M^2	
	II	= 5.3 M^2	including XI = 1.0 M^2
	IV	= 19.2 M^2	
Total			
Living Floor Space		= 31.5 M^2	= 72% of Useful Floor Space
Service Floor Space		= 5.3 M^2	= 12% of Useful Floor Space
Circulation Floor Space		= 2.7 M^2	= 6% of Useful Floor Space
Living Floor Space per person		= 15.7 M^2	
Useful Floor Space per person		= 21.8 M^2	

Type B

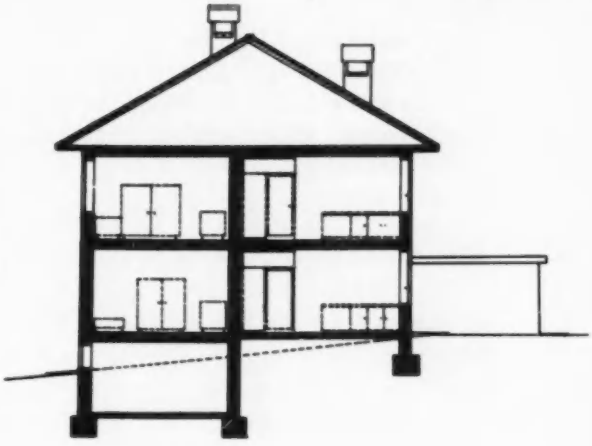
Useful Floor Space	59.3 M^2		
Number of persons	4		
Living Floor Space	I 3	= 7.9 M^2	
	II	= 6.3 M^2	including XI = 1.4 M^2
	IV a	= 15.2 M^2	
	IV b	= 16.2 M^2	
Total			
Living Floor Space		= 45.6 M^2	= 78% of Useful Floor Space
Service Floor Space		= 4.9 M^2	= 8% of Useful Floor Space
Circulation Floor Space		= 4.5 M^2	= 8% of Useful Floor Space
Living Floor Space per person		= 11.4 M^2	
Useful Floor Space per person		= 14.8 M^2	

Type C_1

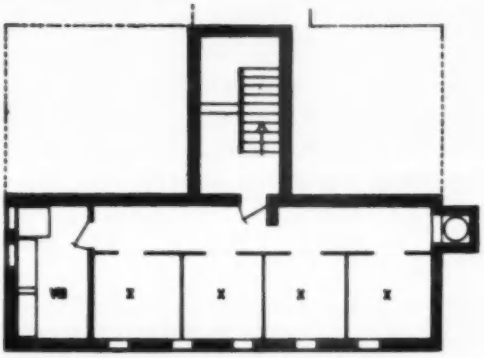
Useful Floor Space	83.1 M^2		
Number of persons	3		
Living Floor Space	I 5 4 b	= 31.1 M^2	including XI = 5.2 M^2
	II 3	= 12.1 M^2	including XI = 2.7 M^2
	IV a	= 19.6 M^2	
Total			
Living Floor Space		= 62.8 M^2	= 75.5% of Useful Floor Space
Service Floor Space		= 9.9 M^2	= 12% of Useful Floor Space
Circulation Floor Space		= 5.4 M^2	= 6.6% of Useful Floor Space
Living Floor Space per person		= 20.9 M^2	
Useful Floor Space per person		= 27.7 M^2	

TYPE A-B

GROUND FLOOR PLAN
REZ-DE-CHAUSSÉE
ПЛАН ПЕРВОГО ЭТАЖА

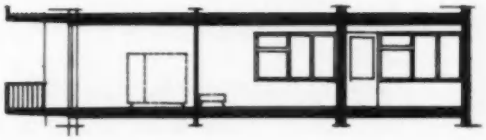


SECTION A-A
COUPE A-A
РАЗРЕЗ А-А



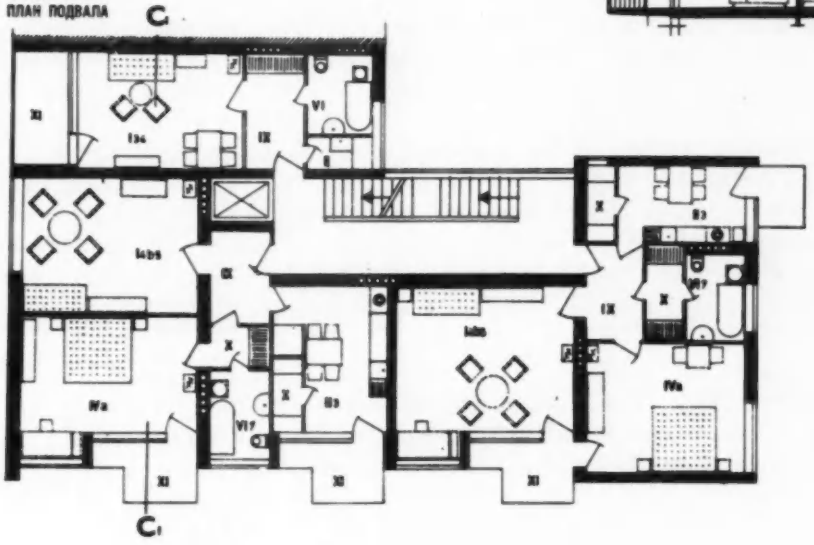
BASEMENT PLAN
SOUS-SOL
ПЛАН ПОДВАЛА

SCALE IN METRES
ÉCHELLE EN MÈTRES
МАСШТАБ В МЕТРАХ



SECTION C-C
COUPE C-C
РАЗРЕЗ С-С

TYPE C



GROUND FLOOR PLAN

Great Britain, Department of Scientific and Industrial Research,
Tropical Building Section.
THE BURNT-CLAY BRICK
Overseas Building Notes, Building Research Station, Garston,
Watford, Hertfordshire, England, No. 61, June, 1959, pp. 1-17.
Illustrations.
691.421 (100)

1. Concrete block has become the usual walling material in many territories. But there are places--for example, Trinidad, Kenya, Uganda, and parts of Southern Africa and South-east Asia--where burnt-clay bricks and blocks are in common use. In fact, it is often the best material where the brickmaking clay contains a significant amount of combustible material or where the fuel required is very cheap.

2. The need for economy in fuel and labour in recent years has caused a revival of interest in large hollow bricks. While it is true that a large hollow brick may have certain advantages over a standard solid brick, it is necessary to ensure that it possesses a balance of advantages. Experience has shown that no one pattern of large brick can adequately replace the common brick. The need will be for a range of new bricks of specific patterns for specific purposes. It is not possible to decide correctly on the brick format and the pattern of perforation required unless the properties that an ideal brick should possess are first considered.

PROPERTIES OF THE IDEAL BRICK

3. Manufacture. The brick should be easy and cheap to make, preferably by automatic or highly mechanized methods. Although the common solid brick is not difficult to make, perforated bricks offer some advantages--notably by increasing the rate of drying and firing. The wire-cut process, which is the one most commonly used for all brick-making (except in Britain, the Netherlands, and some countries where primitive hand-making still predominates), is also the most suitable because perforations may be introduced easily.

4. The time needed to dry and to fire a brick is always much longer than that required to make it; it follows that bricks will need to be stacked at some stage of manufacture. Bricks of simple cuboid shape will be easy to stack. It will not then matter necessarily if the brick has a complex pattern of perforation; indeed this may assist handling. Extrusion by the wire-cut process causes perforations to be exposed on two opposite faces. They may be intended to run horizontally or vertically in the wall.

5. Strength and stability. The brick should be adequately strong for normal building purposes. The common solid brick made in the United Kingdom has a strength far higher than normally required. In Switzerland, flats up to 18-story

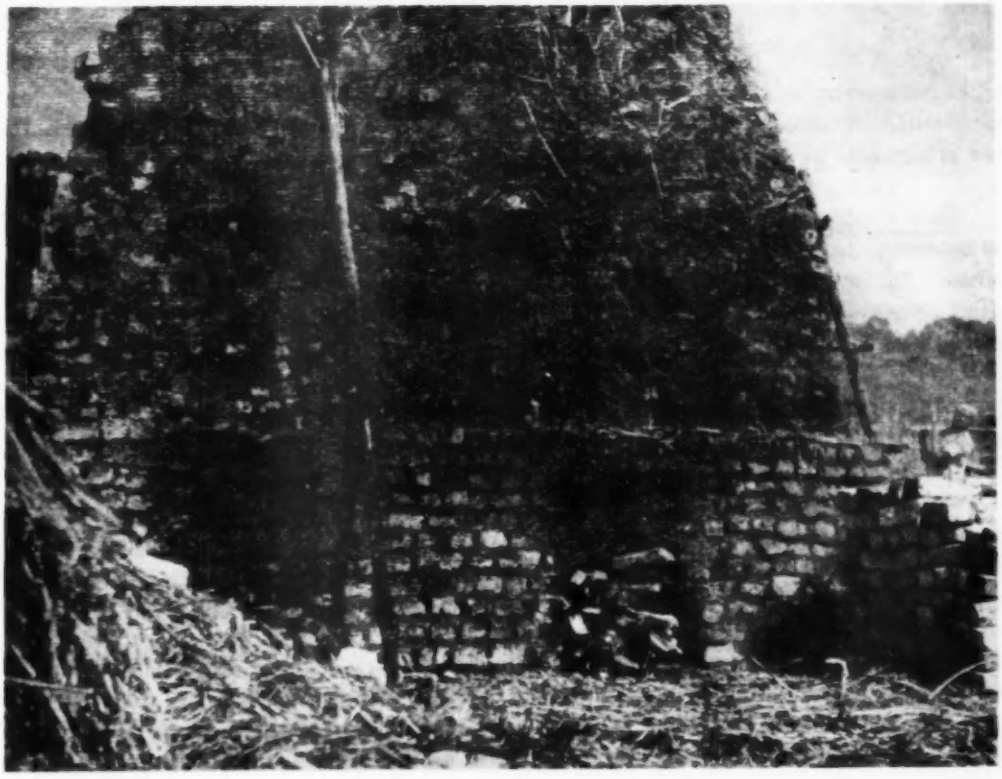


Fig. 1 Uganda, Kabale district. Clamp of bricks ready for burning.

Fig. 2 Uganda, Kabale district. Typical clamp-burnt bricks.

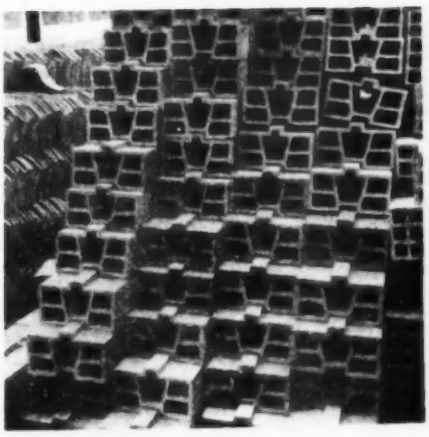


Fig. 3 Uganda, Kampala. Horizontally-perforated burnt-clay bricks of high quality.

height have been built with load-bearing perforated bricks not thicker than 15 inches. The experience already gained in European countries, shows that strengths using perforated bricks will be entirely adeqaute for normal building purposes.

6. Rain resistance. Adequate resistance to rain penetration is of great importance. The common, solid brick made in England measures approximately 9 inches x 4 1/2 inches x 3 inches. A 9-inch thick solid wall built with such bricks is not sufficiently resistant to rain penetration. It may become so if it is rendered; alternatively, the bricks may be used to form a cavity wall, the two leaves of which are joined together by metal ties. Rendering is often disliked for aesthetic reasons, for it involves the loss of appearance that facing brickwork provides: cavity construction may be structurally undesirable in tall buildings. In tropical areas there may be additional or alternative reasons why rendering or cavity construction is undesirable. In low cost building, for example, rendering may prove too expensive. Cavity walls call for a higher standard of constructional skill than single-leaf walls and are disliked on grounds of possible insect and vermin infestation. There is, therefore, good reason to develop a brick which can be used to build a single-leaf wall and which, if left unrendered, will prevent rain from penetrating through to the inner wall surface. Any large, perforated brick developed to meet these needs must first be of such form and have such capillary properties that direct penetration through it is unlikely even under the most severe conditions. This requirement is not unduly difficult to fulfill--it is known from experience that rain usually penetrates through imperfect joints between the brick and the mortar and not through the materials themselves. This being so, clearly the way to resist penetration through vertical and horizontal joints is to interrupt them so that there is no direct capillary path. To ensure an interrupted joint it is desirable that the brick be so made that it is difficult for the bricklayer to spread a continuous bed of mortar, even if he tries.

7. The two-leaf horizontally perforated bricks, shown in Fig. 5, have one or both bed faces divided by a lengthwise groove which enables the horizontal mortar joint to be interrupted. Where there is an open arrangement of the webs in the middle of the brick, as in the French B.1 (Fig. 5c), the brick-layer is prevented from laying a continuous vertical mortar joint too. In practice, the French B.1 brick has not proved entirely satisfactory although earlier rain penetration tests had proved promising; its resistance to rain penetration when unrendered is still doubtful. A horizontally-perforated brick with an up-standing centre ridge provides a more positive barrier to rain penetration through the horizontal mortar joints. The Australian brick (Fig. 6) patented in 1902, is probably the earliest of this type. The ridge, which might be square, circular or conical in form, was a loose fit in the groove. The Denison Z tile (Fig. 7) is a further example of a brick designed to give a stepped horizontal joist so that the wall has no through horizontal joints.

8. Tests on the rain resistance of walls built with vertically and horizontally perforated bricks were done at the Building Research Station. The vertically perforated bricks were designed and made at the Station and known as V1, V2, V3, and V4.

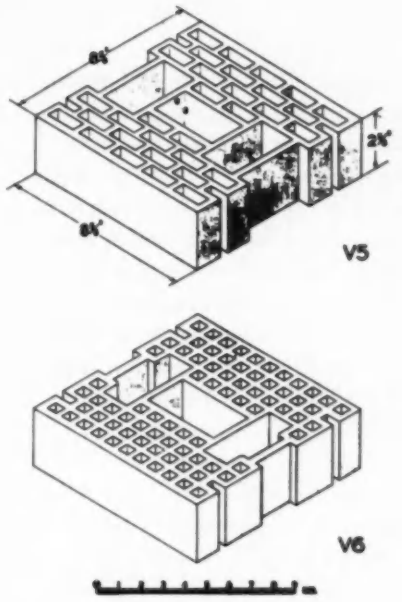


Fig. 4 Vertically-perforated bricks designed and made at the Building Research Station.

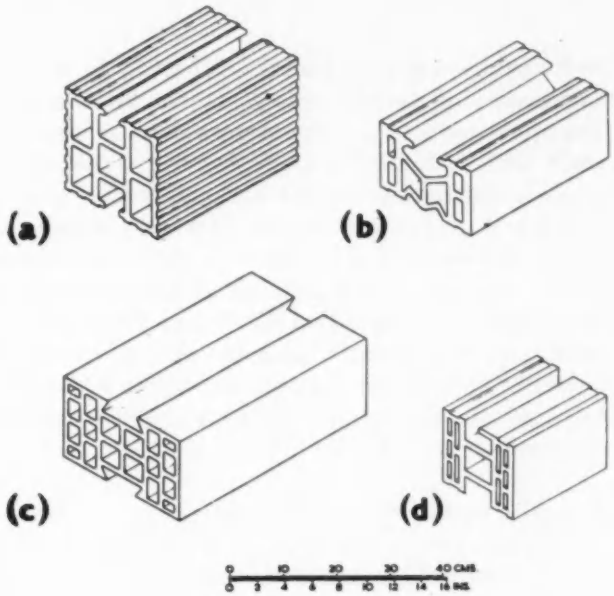


Fig. 5 Horizontally-perforated two-leaf cuboid bricks.
(a) American "Kwiklay No. 35"
(b) American "Speedwall LBX"
(c) French "Type B.1" hollow brick
(d) British "Phorpres block".

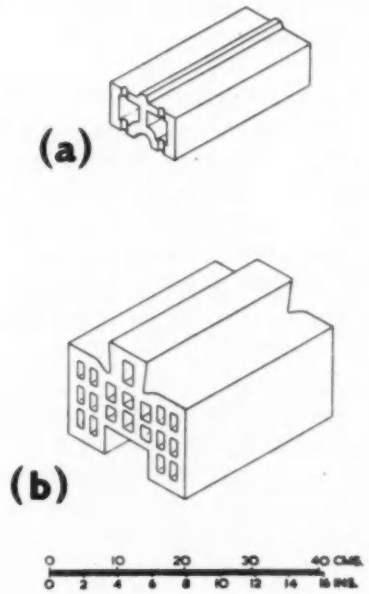


Fig. 6 Horizontally-perforated centre-ridge bricks.
(a) Australian Jaubert's "Improved brick"
(b) German Ludowici "National Stein".

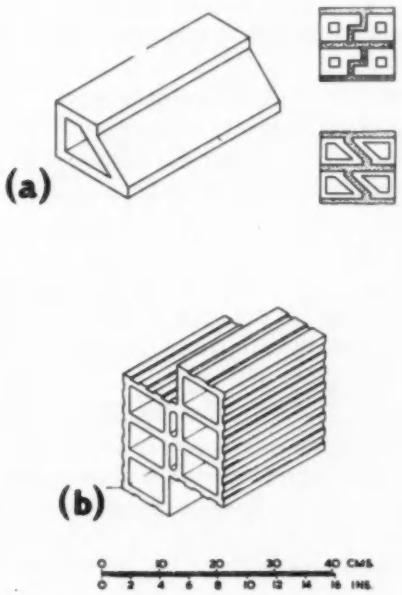


Fig. 7 Fancy bricks of historical interest.
(a) British Henry Roberts 1849
(b) American Denison "Z" tile.

Horizontally-perforated bricks, H1 and H2, were designed by the Station and made, with some slight modifications, by two brick manufacturers. (See Figs. 9 and 10). The bricks were laid with separate strips of mortar in the horizontal joints and the walls were subjected to a spraying test. The walls were sprayed with water by means of six sprays arranged along a top horizontal pipe. Spraying continued for 6 hours at a rate of 1 gallon per minute. The walls were approximately 8 feet high and 4 feet wide, whitewashed at the back so that any dampness which penetrated was clearly seen. The back of the wall was examined at frequent intervals to the maximum time of 24 hours. A single leaf 4 1/2 inch thick wall built of normal solid bricks is usually penetrated in 5 minutes; a cavity wall of normal good construction remains dry indefinitely. It is arbitrarily considered that if the back of the wall remains dry after 6 hours, its resistance to rain penetration is satisfactory; if dry after 24 hours, its resistance is excellent.

9. The results showed that vertically-perforated bricks with staggered slot perforations can give single-leaf walls that resist rain penetration as well as walls built with horizontally-perforated bricks specially designed for rain resistance. Following these tests on the V1, V2, V3, and V4 bricks, the V5 and V6 were designed (Fig. 4). Walls built with these bricks and subjected to the rain penetration test showed no penetration 24 hours after the start of the test.

10. Thermal insulation. The ideal brick should enable the wall to have adequate heat insulation. That provided by a solid 9-inch brick wall is insufficient to meet the standards now required in the United Kingdom. In the tropics it is insulation against heat that is most needed although at night in some areas there is also a need to prevent the loss of heat from a building. In hot, dry regions high thermal capacity may be of more importance than a high degree of thermal insulation.

11. High standards of heat insulation can be obtained with perforated bricks, particularly where perforations are slotted, parallel to the face of the wall, and arranged in a staggered formation to give a circuitous path to heat flow. The Swiss B.25 (Fig. 8a) gives a path of heat flow twice as long as the wall thickness. The thermal properties of bricks depend not only upon their pattern but also upon the clay from which they are made. The mortar joint may well be inferior in insulation qualities to the perforated brick. Large units with few and narrow joints will then give better insulation. Alternatively, it may be possible to use an insulating, lightweight mortar or to apply mortar in such a way that it, too, is slotted.

12. Durability. The normal solid brick as known in the United Kingdom is satisfactorily durable, deteriorating only because of frost (a condition not operating in the tropics). In the topics attack is mainly through efflorescent salts, derived either from the raw material from which the brick is made or through rising ground moisture. Deterioration and shrinkage cracking is small and should be no more serious for perforated than for solid bricks.

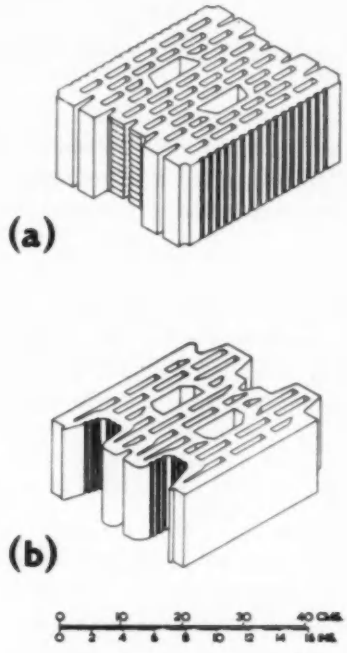


Fig. 8 **Vertically-perforated recessed-end bricks.**
(a) Swiss "B.25" brick
(b) French "CY" brick.

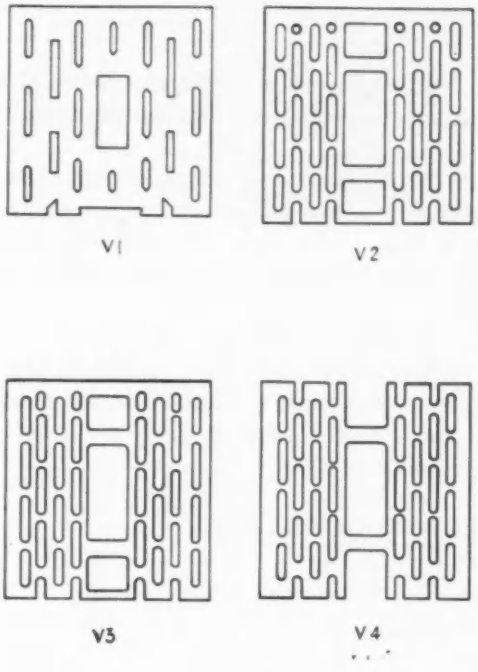


Fig. 9 **Successive modifications** of vertically-perforated bricks designed at the Building Research Station.

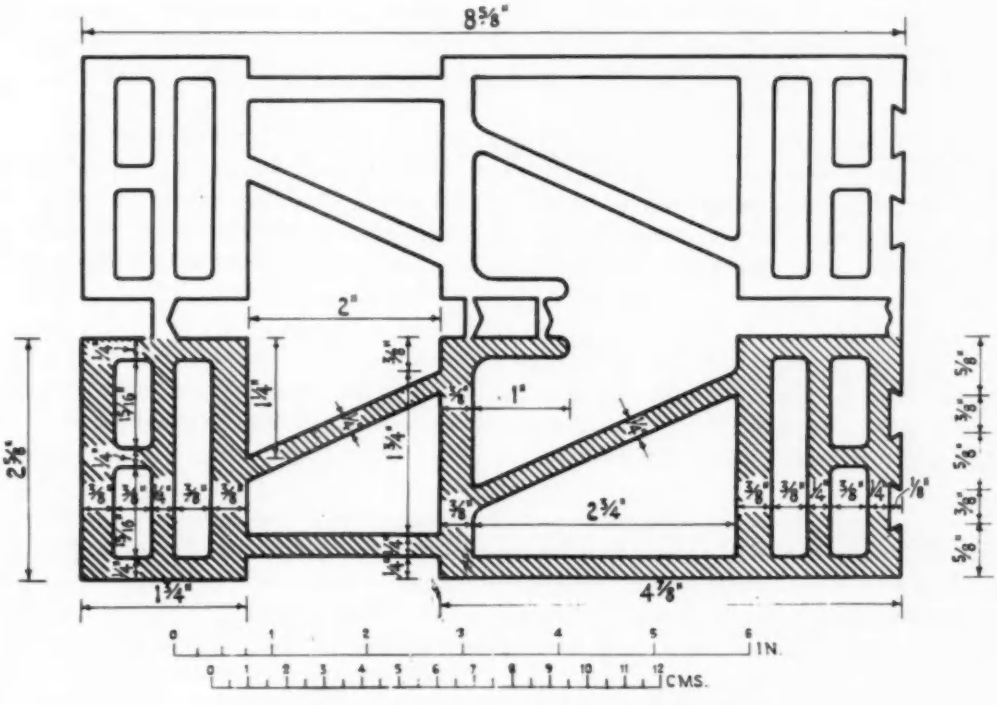


Fig. 10 **Horizontally-perforated bricks** designed at the Building Research Station.

13. Fire resistance. The capability of perforated instead of solid bricks to give adequate fire resistance has not yet been tested.

14. Sound insulation. Sound insulation increases as the total mass increases, thus perforated bricks will provide a less sound-proof wall than a solid brick of equal thickness. The difference is seldom likely to be of critical importance. However, solid bricks will probably be needed for party walls.

15. Fixing and cutting. By drilling and plugging, fixtures may be readily attached to hollow bricks; nailing is more difficult for there is a tendency for the bricks to shatter. Vertically perforated bricks have, in general, relatively small holes. These can be chased to take conduit, etc., more readily than horizontally perforated bricks with large cavities.

SIZE AND SHAPE

16. Bricks based on standard sizes. Perforated bricks may be made with their length and width of standard size but with their height increased--usually to one-and-a-half times or double the standard. Such bricks are little heavier than solid standard bricks and will allow all the usual bonds and wall thicknesses to be used. Alternatively, all three dimensions may be increased in the same proportion with a central perforation to facilitate handling. (See Fig. 12.) These are easy to stack and to lay and may also improve thermal insulation.

17. Plain cuboid bricks with horizontal perforations. The horizontally-perforated plain cuboid bricks shown in Fig. 13 are typical of their class. Normally rendered, or used as a backing to facing bricks, they are rapidly laid and easy to stack.

18. Two-leaf cuboid bricks with horizontal perforations. Figure 5 shows four horizontally-perforated bricks in which one or both of the bed faces are divided by a lengthwise groove. These grooves enable a brick to be picked up easily, although it may be too wide to be spanned with one hand; they also enable the mortar joint to be interrupted. In all four bricks vertical webs are kept straight to carry the loads, and cross webs are staggered to lengthen the path of heat flow.

19. Centre-ridge bricks with horizontal perforations. The value of an up-standing centre ridge as a barrier to rain penetration has been mentioned; it may also serve as a hand grip. Stacking will be less easy with a brick such as the "National Stein" (Fig. 6b) than with a plain cuboid brick.

20. Plain cuboid bricks with vertical perforations. The type of brick shown in Fig. 14 is easy to stack. There may be some difficulty, however, in placing the bedding mortar with some types. Where the holes or slots have a minimum dimension not greater than 3/4 inch there is little difficulty. With holes such as shown in Fig. 14a, the brick would need to be bedded on strips of mortar placed on double shells.

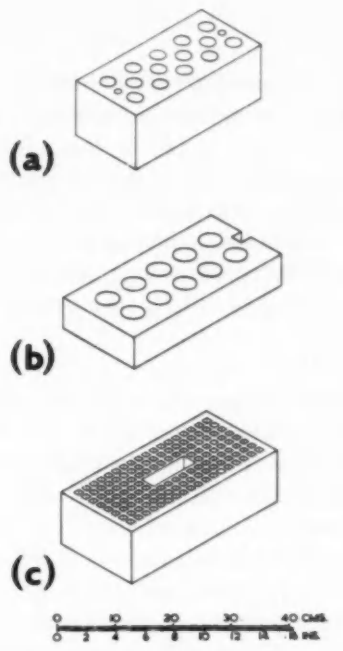


Fig. 12 Oversize standard bricks.
(a) Swiss "1½ Normal format" brick
(b) American "SCR" brick
(c) Belgian "Rapid construct" brick.

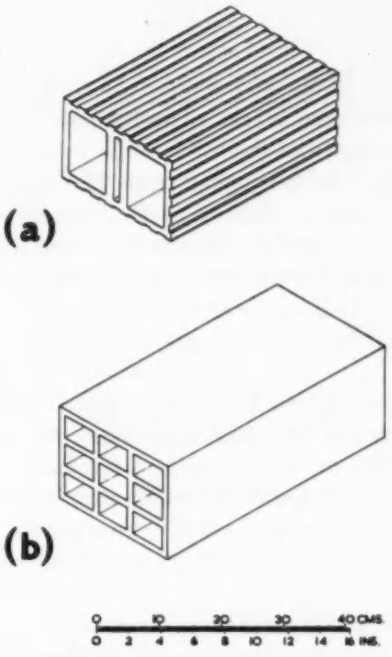


Fig. 13 Horizontally-perforated plain cuboid bricks.
(a) American "Heath horizontal cell tile"
(b) French "15 x 20 x 40" hollow brick.

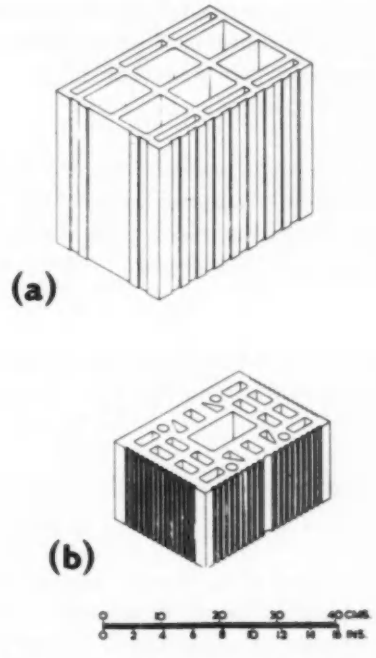


Fig. 14 Vertically-perforated plain cuboid bricks.
(a) American "Vertical-cell double-shell backer tile"
(b) Swiss "I.18" brick.

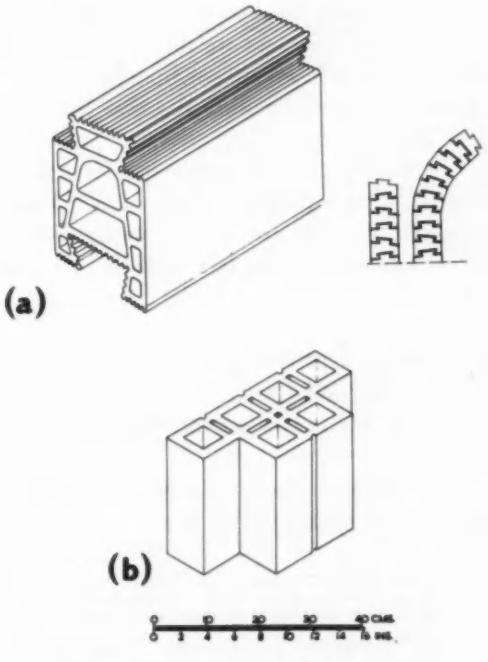


Fig. 15 Recently developed fancy bricks.
(a) Italian "Castelli's trapezoidal"
(b) Austrian "Bruckmayer's Murblock".

21. Recessed-end bricks with vertical perforations. Figure 8 shows vertically perforated bricks with the middle of each end recessed to give a definite break in the vertical mortar joints. Interruption of the horizontal joint is left to the bricklayer; by arranging a row of large holes in the length of the brick it can be made difficult for him to spread a continuous bed of mortar across the wall. The V5 and V6 bricks (Fig. 4) are very easy to lay for they can be picked up with a grip of standard brick width immediately over their centre of gravity; moreover, they can be placed without the bricklayer's thumb fouling either the levelling line or the next brick. They are also easy to stack.

22. Bricks of fancy shapes. The bricks so far described have all been basically rectangular parallelopipeds. Other bricks have been developed, however, which differ considerably from this basic shape. Figure 72 shows the brick developed by Henry Roberts, a London architect in the mid-19th century. Roberts' bricks laid as stretchers overlap in the middle of the wall--a sound principle. Those bricks, which needed to be laid with the wider of the two bed faces upwards, were difficult to handle. The Castelli trapezoidal brick (Fig. 15a) gives a vertical wall if the bricks in alternate courses are turned opposite ways and an arch if all are turned the same way. The "Murblock" (Fig. 15b) is provided with grooves and slot perforations to enable it to be easily cut and gives a wall with no through vertical joints.

TYPE OF PERFORATION

23. Ease of manufacture. The vertically-perforated brick is rather easier to make for it tends to give less trouble in drying. The horizontally perforated brick gives somewhat easier convenient handholds and it is also easier to make horizontally perforated bricks such that the bed joint is divided into two strips.

24. Weight. Horizontally-perforated bricks can have large perforations and consequently a high proportion of voids. Hence very light bricks can be made. This is more difficult with vertically-perforated bricks, for perforations must be relatively small or mortar will be lost in them. However, it is still possible to get 50-60 percent voids.

25. Laying. With horizontally-perforated bricks there is no difficulty in spreading mortar for the bed joints, but the vertical joints may be more difficult. The reverse is true with vertically perforated bricks.

26. Strength. Horizontally-perforated bricks are weaker than vertically-perforated bricks, other things being equal.

27. Cutting and need for "specials." Horizontally-perforated bricks are difficult to cut at right angles to the perforations and half and quarter length "specials" must be made for bonding purposes. "Specials" are also needed at corners and openings to

close the row of perforations. Vertically-perforated bricks will, on the whole, be easier to cut and may not need "specials" at corners and openings.

28. CONCLUSION. There are undeniable advantages both to manufacturer and user by producing large, perforated bricks as opposed to small solid bricks. It should be borne in mind, however, that some bricks of large size with complex patterns of perforation may present undue difficulties in manufacture for the existing plant and quality of labour.

29. It has been shown that the strength and stability of walls built with large, perforated bricks should be adequate for normal building purposes; this will be as true for normal tropical areas as for normal temperate ones. A good measure of rain resistance can be obtained with a 9-inch unrendered solid brick wall. Thermal insulation is improved by using perforated bricks but, thickness for thickness, thermal capacity will be reduced. In hot, dry areas thermal capacity may be of more importance than thermal insulation. If two walls of the same weight are built, however, even in hot, dry areas, the advantage will lie with the wall of perforated bricks. Perforated bricks produce a less sound-proof wall than solid bricks of equal thickness but the difference is seldom of great importance except in party walls. For normal housing, the fire resistance of a wall of perforated bricks should be satisfactory.

30. This Note has dealt with the burnt-clay brick used for walling. There are other uses for it such as in prefabricated floor and roof beams, as permanent shuttering to concrete, and in prefabricated wall panels. The development of the large, perforated brick for walling should be considered as a useful step towards development for these other purposes.

McGrath, Hazel
SUN-DRENCHED RESEARCH
Wisconsin Alumnus, June, 1959, pages 17-18. Illustrations
697.24 (100)

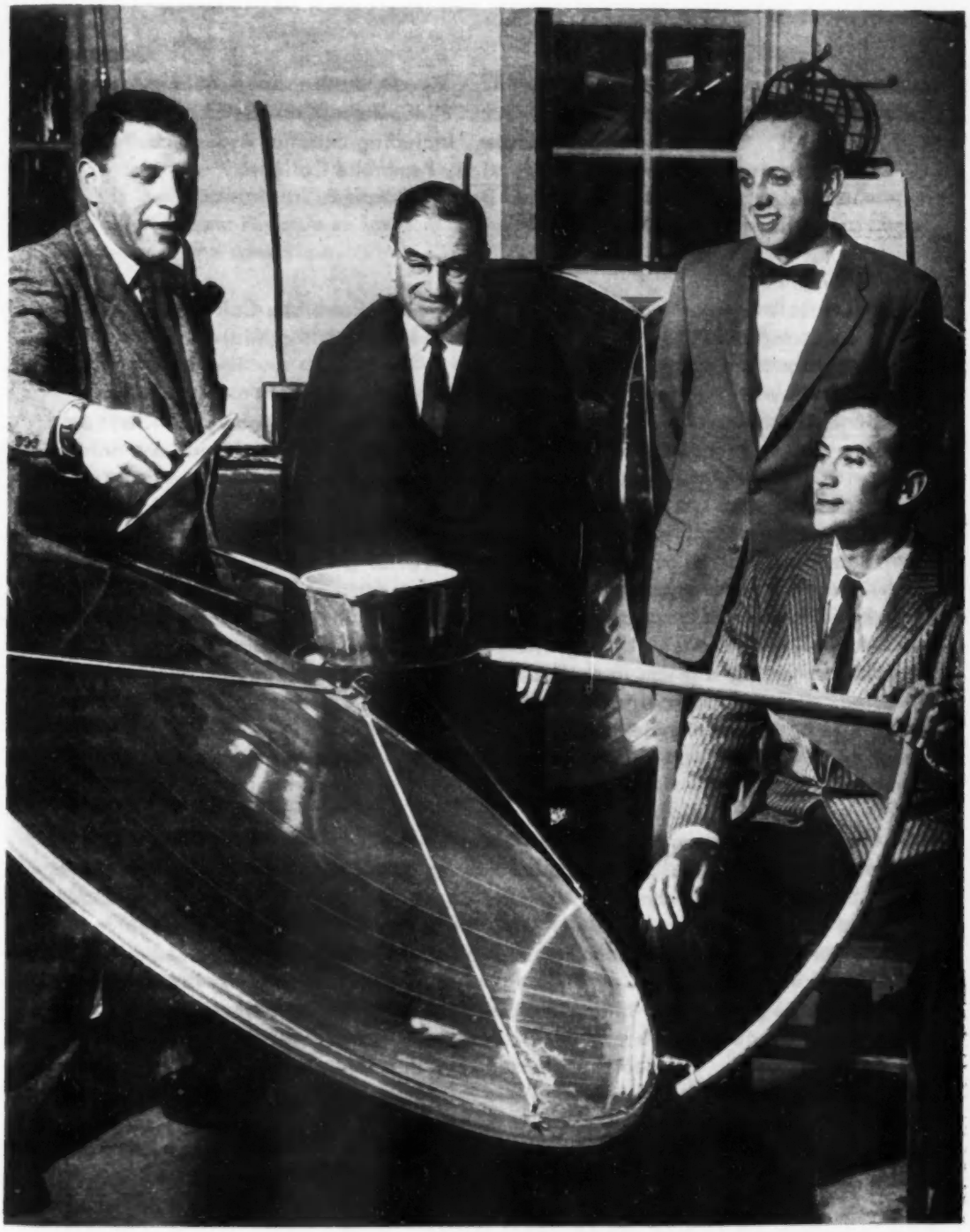
1. The use of solar energy is a subject of great interest to the future economy of developing nations. Because of this, EKISTICS has covered various aspects of potential uses of energy from the sun: a solar experimental house and obtaining hot water from the sun were reported in the March, 1959, issue. At the University of Wisconsin a team of researches under the direction of Professor Farrington Daniels, chairman of the chemistry department, have been working on the development of a solar stove since 1955.

2. This team consists of engineers, chemists, anthropologists, and economists. The anthropoligists work at the site of the stoves test useage by American Indians in Arizona and Mexico. It is their job to find out if the solar cookers developed by the engineers are effective in constant daily use. And if they are, will the people for whom they are intended--who live in areas where only sunlight and poverty are plentiful--be willing to change their customs and use them every day?

3. Although scores of cookers have been distributed in various underdeveloped areas of the world, until now no extensive day-by-day studies have been made of their efficiency and social acceptability. "The Indians laughed when we set up the first cooker last summer," Professor Barneet, head of the anthropologists, reports. "This was at our field station near Parker, Arizona, where we demonstrated the cooker for the members of the tribal council. They were sufficiently impressed to enlist the co-operation of all four tribal groups, and we have now distributed over 40 cookers among individual Indian families in the area."

4. The anthropologists spend a preliminary period with the Indians to gather basic ethonographic data on their physical characteristics and social and cultural traits and to establish friendly relations with the families who will participate in the testing. Only then do they bring in the saucer-shaped and plastic-coated cookers which collect and concentrate the rays of the sun on a pot or pan mounted on an attached rack.

5. The heat is intense enough to boil a quart of water in 10 minutes. They carefully demonstrate the cookers until the natives have mastered the operation, and then they observe personal and cultural reactions to them. One of the Hopi women suggested that hot water for laundry was a problem. The anthropologists reported this to the engineers, who then designed a solar unit to heat water. The engineers are working on a design for a do-it-yourself kit to cut down the cost of the heater and make it more available to people short of cash; and two students in chemical engineering are designing a field sterilizer for doctors and nurses in isolated places.



Anthropologists Milton Barnett and Robert Ravicz, left and right, discuss a model solar cooker with two University solar energy researchers, Profs. Farrington Daniels and John A. Duffie.

Dipcharima, Zanna Bukar (chairman) and Wrigley, E. A. (rapporteur)
EXTERNAL ASSISTANCE AND DEVELOPMENT PROGRAMMES
Group I. "Development Programmes, Including External Assistance," Royal Institute of Public Administration, Pembroke College, Cambridge, 1959. Mimeographed Draft. 13 pages.
336: 711.1 (100)

1. This article is group I of a set of four seminars at Pembroke College, Cambridge, held in the spring of 1959. The chairman for this section is the Minister of Commerce and Industry for the Federation of Nigeria.

2. General Problems in Underdeveloped Countries. A preliminary, but often crippling, difficulty is the lack of accurate information about the human and natural resources of the country. Where there is no good population census material available and no accurate vital statistics are kept, there may be serious difficulties in estimating such things as the school and hospital requirements of the country, or in forecasting the size and composition of the labour force. Without an accurate soil and land use survey it may not be easy to make the best provision for agriculture; it is impossible to plan mineral developments successfully: and irrigation and power projects may hang fire. Vague information necessarily means vague planning. If an appearance of accurate forecasting is given in these circumstances, then that appearance may prove deceptive, with unfortunate results when the plan is put into operation. To demand complete information in these matters might inhibit all action, but the absence of accurate information is a very serious problem, and its procurement warrants a high priority.

3. Another problem which compounds uncertainties in development plans is the difficulty of knowing what the sums available for developmental purposes will prove to be. Even after every domestic source of capital has been fully exploited, under-developed countries cannot generally raise the capital needed to promote rapid development from their own economy, and so must obtain money from overseas. The more any development plan is dependent upon external loans to bring it to successful completion, the greater will be the element of uncertainty in preparing investment plans. Dependence upon money borrowed externally, moreover, may bring other problems in its train. The debt must be serviced in foreign currency and this may limit the uses to which it can be put in two respects. In the first place, the loan must usually be used on projects which give a quick return on investment, or an improvement in the external balance of trade. It may be difficult to use such money for the provision of social overhead capital. A second difficulty, which follows upon extensive foreign borrowing, is the danger of running into a balance of payments crisis in the attempt to meet the servicing payments on the debt.

4. While the lack of financial resources may prove very serious in under-developed countries, the lack of skilled personnel is sometimes a more restrictive factor. Skilled

men are very scarce and in many cases can be obtained only from overseas. Sick men cannot work hard: uneducated men cannot provide new sources of technical and clerical personnel.

5. It is quite possible to emphasize social advances to the point where they form an annual charge upon revenue so large as to make it difficult to pursue economic aims successfully at the same time.

6. A problem which commonly faces underdeveloped countries is that of deciding what restrictions, if any, should be placed upon the entry of foreign firms. To allow all firms to enter without discrimination may provoke some economic developments which are of little or no benefit to the economy: but on the other hand, to impose severe restrictions may dispose outside firms to ignore the country entirely.

7. Problems of using international agencies. Although much economic help has been obtained from international agencies, many difficulties are experienced by underdeveloped countries in seeking and using international aid. It is not always easy to discover how international agencies which make loans or grants operate, and what sort of information they require before making decisions on applications. When this is unknown it may prove difficult to frame a proposal in terms which will make it likely to gain approval. Since the framing of proposals to such bodies is often costly both in time and money, this may discourage applications. Moreover, the use of international agencies as a source of capital involves long delays, often of months or years, and these add greatly to the difficulties of planning. Even after a favourable decision has been obtained, there is often a further long time-lag before the men or the money which have been granted are actually available.

8. Preparation of the Plan. No plan can have much hope of success unless adequate information is available about the feasibility of the schemes which are considered. Detailed planning belongs to a later stage in the plan, but it is essential to know what is technically possible within the financial limits set by the capital available for development. The plan itself may well arise from an assessment of the size and nature of the resources of the country, since it is information obtained from such survey and research teams which should guide those responsible for producing a plan.

9. It is most important to establish the relative priority of different fields of investment, having regard to their growth possibilities. Such decisions belong to an early stage of the planning process, since without them those responsible for constructing the plan in greater detail will be greatly handicapped; and if there are several bodies involved their proposals may prove incompatible.

10. Consideration should be given in preparing the plan to the question of the types of project which should be left to private enterprise and which should be

carried out by the government, by public bodies or by others: universities or cooperative organizations, for example. Account should always be taken of what is known about the plans of the private sector of the economy. Provision for a close co-ordination between private and public work is essential if full benefit is to be obtained from both. Sometimes it may be possible, by a judicious mixture of public and private enterprise, to bring into being schemes which could be beyond the resources or the competence of either separately, as in the government provision of main services to an industrial site.

11. Considerations which should be borne in mind in framing the plan:

a. The plan should govern the allocation of available resources and be concerned with the general phasing of schemes.

b. It is important to create a mechanism for considering progress reports, for frequent review and periodic revision of the plan.

c. It may be useful to indicate priorities upon different assumptions about the amount of capital which will be available.

d. It is important to be sure that the recurrent expenditure, implied by the capital outlay undertaken during the plan, is no larger than the additional revenues which are in sight by the end of the planning period.

e. It may be worthwhile in some underdeveloped countries to consider the question of the minimum standards of personnel and construction which are acceptable in some services: for example, education and health. It may be better, for example, in the early stages of development, to design a dispensary which is very simply built and equipped and to employ there a nurse whose training is less complete than is normal elsewhere, if by doing so more units can be established by the outlay of a given sum.

f. A decision of principle may be called for in the question of encouraging the development of local firms as a matter of policy where they are able to offer the same services or produce the same goods as overseas supplies.

g. It is important to ensure that staff in executive departments as well as in planning offices should have sufficient time free from routine activities to frame plans.

h. It is essential to make use of every resource in mobilizing internal sources of capital.

i. The long-term trends and objects are important considerations in implications for the future balance of the economy.

Ramgoolan, S. (chairman) and Butterworth, Ruth (rapporteur)
CENTRAL GOVERNMENT ORGANISATION FOR ECONOMIC PLANNING AND DEVELOPMENT.
Group 2. Royal Institute of Public Administration, Pembroke College, Cambridge, 1959. Mimeographed Draft. 16 pages.
35:338:711 (100)

1. Dr. the Hon. S. Ramgoolan, Ministerial Secretary to the Treasury of Mauritius, served as the chairman of this second group of the seminar. In his presentation of various governmental organisations for the planning authority, while presenting all arguments, he seemed slightly biased by his own point of view in the Treasury Ministry.

2. The Necessity for a Central Planning Unit. A consideration of the problems facing governments in the sphere of economic planning and development raises at once several fundamental questions of an administrative nature. The first of these is the question of whether there should be a central organisation for planning and co-ordination.

3. It seems clear that the scale of development aimed at in any one country will affect the scale on which the central government machine seeks to intervene in economic affairs by direct action. This same factor will, therefore, affect the nature of the central organisation agency or mechanisms through which the central government deals with overall planning and development. That is to say that the more highly developed a country is, the less scope there will be for the central government in the sphere of planning and direct financing, for development and oversight, as well as execution of national plans. The less economic development already existing in a country, the more vital is the role of the central government in the creation of conditions conducive to development and in the planning and execution of development projects.

4. The Function and Location of the Planning Unit. The functions of a national planning unit may be defined as, first, the preparation of an overall plan for economic development which will be based on a survey of needs and resources, and the collation of plans submitted by the spending departments; second, the receipt, scrutiny and analysis of progress reports from the executive departments and other bodies engaged in the implementation of various parts of the plan, and the forwarding of these analyses to the departments and to government. Depending on the resources of the executive departments, it may also be desirable for the planning unit to provide these departments with trained personnel to assist in the detailed working out and evaluation of projects and schemes, once these have been set in train by the various departments. The planning unit must be accorded senior status and attached to a senior Minister. It cannot operate simply as a research bureau or secretariat; it must be regarded as a common service unit for the national economy.

5. Bearing in mind these factors, it seems that there are three possible locations for the planning unit: in the Ministry of Finance; in the Prime Minister's office; or in a separate Ministry.

6. Several major factors of particular importance in underdeveloped countries support the location of the planning unit in the Ministry of Finance. In the first place, any new project, and, therefore, by extension, any overall national plan, will normally be submitted to the Finance Ministry for examination in the light of budgetary considerations and resources available. In many cases the Finance Ministry has built up and needs its own body of experts in order to give proper scrutiny to the plans submitted. This may not, of course, be true in some newly developing countries. Where it is so, however, any attempt to build up a separate planning unit apart from the Finance Ministry, may both draw off personnel from Finance and duplicate the work of the Finance Ministry.

7. Three broad categories of argument may be adduced against the proposal to locate the planning unit in the Finance Ministry. These categories may be termed the 'psychological,' the 'administrative,' and the 'constitutional' arguments. Under the first head, it may be argued that Finance Ministries are constitutionally and necessarily conservative and cautious, concerned with tailoring departmental demands to fit the financial facts of the country's life. The role of the planning unit, on the other hand, is properly expansionist in nature. The administrative argument may be briefly summarised as being that the Finance Ministry is already a full-time job for its ministerial head. In this connection, third argument, the broader constitutional implications of the location of the planning unit, must be taken into consideration. It may be argued that it is more conducive to both administrative and political health that there should be two departments which can claim and are able to take an overall view of the country's economic affairs. A spending department which has had its estimates cut by the Finance Department will be strengthened in Cabinet by the presence of another Minister who can claim, equally with the Finance Minister, the benefit of an overall view of the economy.

8. The second possibility to be considered is that the planning unit should be located in the Prime Minister's Office. Again, there are administrative and constitutional reasons both for and against this proposal. In certain countries, development and, therefore, economic planning are of paramount political importance. They therefore benefit from having the Prime Minister directly charged with this function. On the other hand this arrangement could bring the Prime Minister himself into the line of fire of the pressure groups. However, if the planning unit were located outside both the Prime Minister's office and the Treasury, it may be even more subject to outside pressures and to party-political forces. The reasons for and against the location of the planning unit in a separate Ministry are, as might be expected, of the same order as those adduced for and against the other two solutions to the problem.

9. If the planning unit were put in a separate unit, the Minister must have sufficient authority to insure that the national plan is not an inflexible instrument. It must be subject to constant review, modification and change in the light of altered circumstances. The decision as to the location of the planning unit will be the result of an equation of the functions of the planning unit and its Minister, plus the needs of the territory, in relation to the resources in terms of personnel and in relation to the size of territory in terms of its Cabinet.

10. The economic planning unit should be regarded as a common service for all departments, the unit fulfilling a collective need. There may be a case for the planning unit, regarded in this light, to be located in the Prime Minister's Office in charge of a junior minister without other portfolio. This solution, however, still leaves the Prime Minister in the position of advocate in Cabinet, where he will be committed to the policies brought forward by his minister. The presence of another minister in the Prime Minister's Office might not, in itself, give to the planning unit sufficient status and authority. In this case, we are returned to the completely separate ministry solution.

11. Where the planning unit is regarded as a common service unit there may be a saving in skilled personnel by concentrating, for instance, economists and statisticians here rather than diluting them through the executive departments. In this case, it must be considered who is the best Minister to be responsible in the House and in the Cabinet for the functioning of this common service. Where there is a tradition of maintaining within the Cabinet men freed from departmental responsibilities, who are recognised as working in close co-operation with the Prime Minister, the planning unit could well be made the responsibility of such an individual.

12. Supervising and Expediting Economic Development: the Location of Powers and Division of Functions. It should be emphasized at the beginning of the discussion of these questions that the easiest way to destroy a planning unit such as is envisaged is to give the unit supervisory powers of such a kind that it becomes a 'snooper' on all the executive departments. The role of the planning unit is not to be that of criticising the staffs of the executive departments. It is, on the other hand, necessary that there should be some central mechanism to ensure the continuous evaluation of progress in particular projects and sectors in relation to others and to the total development plan. It should be emphasized also that the steps necessary to ensure the expeditious implementation of any single project begin at the very stage when the plan for the project is in process of formulation and not simply after the work has been in progress for some time. Obviously, both the planning unit and the executive departments individually have a part to play in this supervisory and expeditory process.

13. Basically, the planning unit, being concerned with the task of co-ordination, must be in a position where first it receives proposals from the executive departments and collates these into an internally consistent national development plan, having regard for the resources available; and second, it receives reports on the particular projects and schemes from the executive departments. These two phases may be designated the pre- and post-budgetary phases.

14. It has been implicit throughout the consideration of this subject that the presence of a national planning unit does not, in itself, produce efficiency, eliminate bottlenecks, or ensure the swiftest possible economic development. All these things depend, in the last analysis, on the co-operation between departments and on goodwill. Indeed, goodwill, which is at the basis of co-operation, can operate to eliminate bottlenecks in the worst as well as the best administrative systems. The planning unit itself will, under these conditions of co-operation, constant contact and goodwill, fulfill two functions. It will serve to introduce some degree of rationality into the course of economic development by providing an internally consistent plan for the country and it will assist in the implementation stage by the provision of certain technical assistance, while continuing its rationalizing function in the collation and review of progress reports.

Melmoth, C. G. F. F. (chairman) and Roberts, Ruth (rapporteur)
THE ROLES OF PUBLIC CORPORATIONS, PRIVATE ENTERPRISE, AND CO-OPERATIVES.
Group 3. Royal Institute of Public Administration, Pembroke College, Cambridge, 1959. Mimeographed Draft. 24 pages.
336:332:334 (100)

1. A definitive statement on the relation of public corporations to other sectors of the economy in underdeveloped nations was outlined in the third group of reports of this seminar. The chairman for this section, Mr. C. G. F. F. Melmoth, Minister of Finance and Financial Secretary, Uganda, was aided by Miss Margaret Roberts of the London School of Economics, who served as rapporteur.

2. Assuming that it is the aim of underdeveloped countries to reach the stage of self-sustaining growth as soon as possible, this requires development on a scale and at a pace unprecedented for under-developed nations. In the past, the system of private enterprise has been responsible for the exceptional development and the rapid rate of capital accumulation in the Western World. It is desirable that the advantages of private enterprise should be allowed to accrue to the under-developed economies today. However, most of these economies are short of some of the essential factors, notably capital and entrepreneurship, witnout which the system cannot develop quickly. Further, the rate of development which we envisgage as essential to most under-developed countries is higher than that which can be expected to be achieved by a system of private enterprise, which has to 'pull itself up by its own boot strings.'

3. One of the chief tasks of government is to create the conditions in which private enterprise can contribute its full share to the process of capital accumulation. Public corporations represent one of the main instruments of Government to this end. The chief advantage of a public corporation over a government department is that, being semi-autonomous, it is not subject to political pressures or to supervision of its day-to-day administration, and it therefore has the necessary freedom to take quick decisions.

4. Since it is not the aim of the government of these countries to replace or supplant private enterprise but rather to stimulate and supplement it, these public corporations may either be Government owned and controlled or partners in 'mixed' ventures in which the ownership and control are partly in private and partly in government hands. Either public or 'mixed' corporations are chiefly useful in the following fields:

a. Public Utility Corporations should be established when the provision of a certain service or monopoly organisation is advantageous, to secure the economies of large scale production and to avoid uneconomic competition.

b. For the productive channelling and dissemination of investment capital throughout the economy, Development Corporations generally represent the chief planning and executive instrument. Their functions will include the establishment of subsidiary ventures, both commercial and industrial. Except in some fields of enterprise, in which it is government policy to maintain control, it is almost always the intention to transfer these subsidiary companies to private control as soon as the private capital and/or management can be found.

c. A service which is generally best carried out by a Public Corporation or a Government Department is that of statistical survey, resource discovery, investigation of economic opportunities and the dissemination of this kind of information.

d. Public Corporations have a role in entering such branches of industrial and commercial enterprise as have not, for any reason, been exploited by private enterprise. As the economy develops and private capital becomes less scarce, these activities will become less important.

5. The use of 'mixed' ventures very often achieves certain specific objects apart from the general ones mentioned previously:

a. They have proved to be an effective way of increasing the skills, managerial abilities and administrative personnel which are available locally.

b. 'Mixed' ventures represent a means of keeping some part of the capital of commercial enterprises in indigenous hands, where it might otherwise be held entirely by expatriate individuals and firms.

c. In some parts of Africa it is part of governments' policy to restrict the leasing of land to aliens. 'Mixed' corporations may be used where the economic advantage to the indigenous population is clear, to lessen the braking effect on development that such restrictions may bring about.

6. The Marketing Board type of corporations, which were established primarily for the purpose of centralising commodity marketing and to provide a means of price stabilisation, have also provided compulsory savings.

7. The establishment of training centres for the development of technical skills must usually be the responsibility of Public Corporations or Government Departments, except where particular skills are already catered for by specific private enterprise schemes. However, in the rapid multiplication of skills, which are required through

all levels of economic activity, the role of private enterprise is an extremely important one. In the private sector, both promotion and standards for recruitment and training may be more flexible than they are in the public sector. Personnel requirements are suited to the job which needs to be done, and rigid technical and professional qualifications need not be insisted upon. This has the result of developing a large body of specifically trained but not necessarily technically qualified workers, who can be absorbed into all branches of enterprise.

8. Credit and Marketing Co-operatives are often highly successful. These organisations can be made effective in channelling capital to individual producers since they are in a position to supervise the repayment of loans, especially where marketing is undertaken through their agency. But for other purposes, the experience of different countries where co-operatives are encouraged, varies widely. The general feeling is that although they have not so far been as successful as had been hoped, they are potentially important instruments of development, and improved organisation is likely to increase their effectiveness.

9. To sum up, it is the aim of governments of underdeveloped countries to use Public Corporations and to encourage Co-operatives where private enterprise alone cannot be expected to achieve the rate of growth which is required. The main problem is how best to remedy the lack of certain factors crucial to rapid economic growth. This involves government in participation in a wider sphere of economic activity than is usual in more developed countries where private enterprise has more adequate inducements to commercial and industrial development. It calls for administrative recognition that, in the task of transforming the economy of an undeveloped country, these forms of economic Public Corporations, Cooperatives and private enterprise each have an important role to play.

Stewart, J. W. (chairman) and Soper, T. P. (rapporteur)
THE INTER-ACTION OF ECONOMIC AND SOCIAL FACTORS IN ECONOMIC DEVELOPMENT.
From Group 4. The Encouragement of Individual Participation in Economic Development. Royal Institute of Public Administration, Pembroke College, Cambridge, 1959. Mimeographed Draft. 23 pages.
3: 339 (100) (6)

1. The social effects of economic development has been approached from the points of view of sociologists, economists, technologists working in the field, and politicians. For each, this means the necessity of understanding the factors which may bring about change, or how changes will effect the various facets of the culture. Recently EKISTICS has abstracted two articles on this subject: "Some Social and Cultural Aspects of Economic Development," by Manning Nash, EKISTICS, 46, August, 1959; and "Urbanism and Urbanization," by Nels Anderson, EKISTICS, 48, October, 1959. This month we include the report of the Fourth Group of the Royal Institute of Public Administration Seminar which was chaired by the Secretary, Council of Ministers, Jamaica, Mr. J. W. Stewart, with the services of Dr. T. P. Soper, Queen Elizabeth House, Oxford, as rapporteur.

2. Economic Development and Social Cost. Economic advancement in various underdeveloped parts of the world is liable to meet obstacles of a social nature that can impede progress towards higher standards of living. In Nigeria, for example, the setting up of a water works close to a big town had to be abandoned because the local people regarded the stream as sacred and in consequence opposed the measure. Or again, in the Gambia the reluctance of men to work on the rice crop--traditionally regarded as a woman's job--was an obstacle in preventing the annual occurrence of a hungry season. In addition to difficulties of this kind it also has to be appreciated that economic development cannot take place without social change, particularly in those societies moving from a near subsistence way of life into an individualistic moneyed economy. Even where a considerable degree of monetization has already occurred, new techniques, larger units of production and more sophisticated economic organisation bring into being different patterns, consequently breaking up old relationships. The increased pace of economic development is itself a significant enough factor to cause social tensions within a society unaccustomed to rapid change.

3. In many parts of Africa the movement of peoples from communal tribal subsistence societies into the towns and mining centres as wage earners, brings to the fore many of these social problems in a most acute form. This labour is largely migratory in character, with the adult male only temporarily absent from his rural home, and working for little more than a few months as a wage employee. The effect of this has been in some areas to denude the rural community of those very people needed to maintain stability in the family, as well as to assist in the betterment of

economic conditions there. At the same time, the worker in the town has not stayed there long enough to acquire skills and so increase his productivity, and this has a depressing effect on his wages, which are generally low.

4. Two forces are at work in causing this movement of workers backwards and forwards. On the rural side there is the influence of family and tradition in drawing them back to the land; on the urban side there is the fact that permanent homes, adequate pension schemes and the like are not yet developed enough to engender a feeling of security in many African towns. Two effects of this system can be discerned. In some cases work as a wage labourer has resulted in the acquisition of experience and a little capital, and this has been turned to good use in the rural areas on the migrant's return. But in other cases the various restrictions that exist in rural areas; difficulties over acquiring new land, especially in those regions where individual titles to land do not exist, inadequate transport facilities, the burden of dependent relations, have made it virtually impossible for the returned migrant to invest his savings in growing a cash crop or entering trade. Thus he has returned again to the towns to earn more money to buy the goods that he and his family are daily becoming more anxious to have.

5. In practice, more and more people in African urban areas are becoming settled and urbanised, in the sense that they have been born and bred in the town and have little or no stake in the rural sector. To meet the economic and social needs of these people is a gigantic and costly problem for Government. Home ownership schemes, social insurance and pension schemes, hospital and general health facilities and education are all considered as a vital part of any programme designed to alleviate urban conditions of life.

6. In some ways the agrarian improvements taking place in the rural areas aggravate urban developments, as their basic aim is to move, in some way or another, to a form of individual landholding, thus breaking up the existing communal tenures. This implies the temporary creation of a landless class of people, although there need be nothing sinister about this in itself. Yet, at this stage of development identification with land provides a strong sense of belonging. If this is taken away, some means of providing a feeling of belonging within the social structure is essential, if individual initiative is to prosper.

7. Town life and the attractions of it can justly be regarded as a healthy widening of economic opportunities. Higher net incomes are earned than would have been possible had urban employment been unavailable. In order to avoid the concentration of economic opportunities in a few large towns it is highly desirable for some of the urban services and amenities to be extended into the country. For instance, the provision of electric light and power to rural areas may be necessary for the social betterment of agricultural workers and also as

a prerequisite for the establishment of light industries. Direct government assistance in the extension of electrification may be a necessary ingredient for the success of a development programme.

8. Population Pressure. All government action designed to encourage greater individual participation in economic development will, if it is successful, increase the net income and welfare of the people. This may be regarded as a laudable aim, but the effect of it on a demographic structure of society for a period of years, and the attitude of individuals towards family responsibilities, should not be overlooked. Higher incomes make earlier marriages possible, and earlier marriages lead to an increase in the birthrate. Better medical facilities make it more likely that infant mortality will be reduced, and there thus emerges over the years a pressure of population from the younger members of society. The social effects of this situation carry with them matters of serious concern to many governments.

9. The importance of education and the means of ensuring the most effective participation of the individual in economic development has already been strongly emphasised but, having regard to the demographic trends emerging in many underdeveloped countries, the cost of widening educational opportunities both in terms of buildings and teachers should not be lost sight of. Already in some underdeveloped countries where the problem is acute, a shift system is in operation in most schools. Southern Rhodesia, which has embarked on a five-year education plan, has found that whereas it was expected that by 1960, school places would be needed by some 420,000 children; in fact, by 1958, there were already approximately 430,000 children in schools. The pressure is so great that, while at one time it was thought that 30 new schools a year would be adequate, the number now considered necessary is increased to 45 (an increase of 50%).

10. The Influence of Women. It is important to recognise that changes in the size and structure of populations cannot take place overnight, and the problem that has been briefly outlined is likely to remain a major one for decades. It is, however, worth noting that in the long run a different situation may emerge. The immediate affect of higher incomes may well be earlier marriages and an increase in the birth rate. But after a period of time, as people become more sophisticated, they will start to weigh the relative benefits of additional children to additional household facilities. Furthermore, in urban societies children are far more of an economic burden than in rural areas. On the land they are a valued addition to the labour force: In towns, with compulsory education and factory legislation prohibiting the employment of children, they are an economic liability for many years. Under these circumstances smaller families may become the rule, and this potential trend is likely to be recognised by the influence of the educated woman.

11. In town life, women play a far more dominant role in the family than in rural areas. The woman's desire to have a well-equipped house and fashionable clothes,

encourages her husband to work hard and increase his income. She may therefore be regarded as a most potent factor in encouraging the individual to participate more fully in economic development. Also, when women are themselves working, there is a natural desire on the part of men not to be out-classed, and thus her enterprise will generate further economic activity from the men. The education of women, in fact, is likely to have as forceful effect on economic development as the education of men.

12. Conclusion. Education emerges once more as the essence of the problem. It has, of course, many drawbacks. Those who are new to it tend to be reluctant to take on anything other than white collar jobs, and it is not always the case that these are the posts in greatest need of being filled. But experience in Nigeria has shown that this phase is now being passed, and status in terms of jobs is of far less significance than it used to be; adequate economic reward being what is now sought after. The rate of pay in Nigeria for technicians compares favourably with that for white collar workers, and there seems to be no reluctance on the part of those who have done well at school to enter skilled trades. This state of affairs is not prevalent in many other countries, such as India, where there is a high rate of 'educated-unemployed.' The Nigerian example, indicates that attitudes of mind can change toward this. As problems of developing communities become more deeply understood it is becoming apparent that many economic and social problems, however complex and insoluble they appear at the time, can be solved, provided time is given to those whose responsibility it is to cope with them.

International Centre For Regional Planning and Development, British Group
SYMPOSIUM: THE GAP BETWEEN SOCIAL AND PHYSICAL PLANNING.
Report, March 7, 1959. 10 pages. Mimeographed.
711.1 (410)

1. During this symposium, many of the participants took part presenting various views on the topics. The participants come from a very wide variety of professions concerned in some way with the problems of regional planning. The focal points of the seminar were two papers, one given by Ruth Glass, Head of the Centre for Urban Studies, University College, London, and the other by W. L. Waide, Country Planning Officer, Cambridge.

2. Ruth Glass: We can talk about "bridging the gap between physical and social planning" only if we, in fact, have both physical and social planning. But do we really have either or both? And what about economic planning which is surely equally important? And again, if we indeed had planning in terms of these various aspects, there might be no need, or far less need, to speak of the need for bridging the gap.

3. Perhaps planning can be defined as the recognition that the future is part of present history: the recognition that we have a responsibility for this future, not as an individual future, but in terms of the public interest, as it appears to exist and develop. Seen in that way, "planning" means that we are trying to control and to guide manifold developments in a rational manner, so that they are compatible not only with one another, but also with the general direction of social change in the public interest, actual and potential. During the "honeymoon period" of British planning, the days of the Barlow, Scott and Uthwatt reports, there was an approach to planning of the kind just described, and this approach was reflected to some extent in our statutory and administrative machinery for town and country planning, for distribution of industry and related matters. Just because, since the mid-forties, the outlook on planning has increasingly because more uncertain, and the planning system, too, has been weakened, it is well worth while to reconsider both the background of our planning system and also its considerable achievements.

4. It is largely because planning as an idea and as a system has been taken so much for granted that there has been so little scepticism and evaluation of planning principles, standards and administrative processes. Town and country planning, in particular, has perhaps been institutionalised too rapidly.

5. While the planning systems owes a great deal to the 19th century, it is also hampered by it--and in particular by the ideas of the "utopians." Since the Utopians' vision was essentially one of "looking backwards," town and country planning developed at least as much for the purpose of preventing social change as for encouraging it. Of course, there are some who see these dangers. There are also

rebel movements like those of "Counter Attack" and the "Anti-Uglies." But there are still few who recognise the connection between physical and social ugliness. There are far too few critics and angry young men in planning who are not only concerned with purely aesthetic and sentimental issues, but also with urgent social and economic problems.

6. Max Lock: There is a lack of contact between the planners and the planned. In Aberdare, Cardiff, a plan sought to demolish 4,000 solidly built homes against the wishes of the inhabitants. The public should be in on the making of the plan and not be presented with a fait accompli.

7. W. L. Waide: Planning decisions ought to be made at different levels ranging from national planning through the region and country, to the town. Decisions at these levels must be taken in differing degrees of detail and be inter-related within the whole context of the problem. It is vital to establish the missing tier of the planning hierarchy between the national and the local level. At present, few local authorities can afford the skilled staff needed to interpret survey information; but in a regional organisation, such a staff could be employed. The universities should take over much of planning research.

8. Dr. Koenigsberger, Head of the School of Tropical Architecture, London: It was too much to expect one person to combine within himself the roles of social scientist, economist, physical planner, administrator, engineer, and politician. We have to learn to work within a team.

9. Ruth Glass: While not all sociologists share the view that there is no dilemma in commitment, there are some who felt that it was indeed their duty to have value premises, to state them clearly and to test them wherever possible through objective investigation. There is too much home-made sociology in Planning, largely derived from the romantic ideas of Howard and Mumford, which raised false expectations.

United Nations
REPORT OF THE ASIA AND THE FAR EAST STUDY TOUR ON LAND SETTLEMENT.
United Nations, New York, 1959, 18 pages.

1. The Asia and the Far East Study Tour on Land Settlement was organised by the United Nations and the World Veterans Federation (WVF) in co-operation with the host countries, which were the Philippines, Viet-Nam, Thailand, India, and Pakistan. Participants included administrators of settlement programmes from each of the host countries as well as technical advisors from the United Nations and World Veterans Federation. Although the amount of study possible on a 40 day tour is not very deep in scope, the conclusions which these experts came to and the recommendations which they present represent years of study in terms of a fresh viewpoint.

2. The Study Tour has a special significance and has served an important need. Perhaps nowhere else in the world has the resettlement of people on land been undertaken in as great a magnitude, under the most trying conditions and with as many basic and difficult problems as in this region. It is in this region that the policies, principles and practices of land settlement have been tried for a good many years, and from this past came the valuable experience and ideas that are being used at present. The trial and error method of the past has been replaced by the orderly and careful planning of the present.

3. The Study Tour has also served to advance the principle of the dissemination and exchange of experience and knowledge in land settlement. The further promotion of this principle, we are pleased to say, is embodied in our recommendations.

4. Recommendations. Organization of non-permanent training centres of specified duration for land settlement workers from different countries in selected schemes or projects which offer opportunities and facilities for training in the various aspects of land settlement.

5. Organization of evaluation teams to be placed at the disposal of interested countries to assess the land settlement programmes, schemes and activities in these countries in relation to national objectives and local or specific goals.

6. More adequate initial surveys and assessment of all factors in land settlement such as agricultural, economic, social, cultural, demographic, and including the problems of financing, should be undertaken before planning and launching a programme or a scheme; and adequate assistance from the United Nations, the specialized agencies and other interested organizations should be made available for these purposes.

7. Employment of a land settlement specialist in the ECAFE region to promote land settlement work actively.

8. A second Study Tour on land settlement for participants from countries which did not participate in the first Study Tour should be arranged in the near future, with emphasis on the thorough examination of a few schemes which have special features and are of particular interest.

9. Agreements between countries in the region for the exchange of fellows in the field of land settlement should be encouraged.

10. Studies and research on extension techniques and media to improve and adapt them to the special requirements of land settlement.

11. Inclusion of trained community development workers in land settlement organization to promote self-help activities.

12. Systematic exchange of information, data and experience on land settlement should be made among countries in the region which should utilize all information agencies available.

13. Inclusion of land settlement in the agenda of the ECAFE Working Party on Economic Development and Planning which will discuss balanced economic and social development.

RECENT PUBLICATIONS

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Economic Development. New York, Toronto, London. McGraw-Hill Book Company, 1958. 325 p.

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Ethiopia Today. Stanford, California, University Press; London, Oxford University Press, 1958. 158 p. (25s)

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